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Antiaircraft Defense

By LT. COL. KENYON P. FLAGG, Coast Artillery Corps

Here is a complete manual on the all-important subject of antiaircraft defense. Colonel Flagg has included a full discussion of the Army's newest antiaircraft weapons—the 90-mm. gun and the 37-mm. automatic gun.

The new units now being organized and the National Guard regiments recently ordered into active service will find this book the answer to their call for an inexpensive, yet complete textbook.

A glance at the table of contents will demonstrate the book's all-inclusiveness. Moreover, *Antiaircraft Defense* is liberally illustrated. Send for your copy now.

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TRAINING

By Major General J. A. Green
Chief of Coast Artillery



Expansion of the Coast Artillery Corps has been taking place for more than a year. Many new units have been activated in an orderly and efficient manner. A further great expansion through the Selective Service Act is about to commence. The training of this personnel imposes a major task of utmost importance to National Defense on every Coast Artilleryman. Training Circular No. 2, War Department, September 10, 1940, and a letter addressed to Army Commanders on the subject of "Training," dated General Headquarters, U. S. Army, September 16, 1940, are the basic directives for the accomplishment of this task. Much of the following is based on these directives.

Two training missions are assigned newly formed units of the Regular Army and all National Guard units in Federal Service.

- a. "To train present personnel and units in accordance with mobilization training programs in thirteen weeks."
- b. "To train personnel to be received later."

The older units must be prepared to take the field on short notice at existing strength, ready to function effectively in combat. They must train personnel to be received when increased unit strengths are authorized, and in most cases will be called upon to furnish large numbers of trained cadres and instructors for the operation of replacement centers and the formation of new units. This is admittedly a large order and will call for a maximum effort on the part of each individual.

The War Department has prescribed that the replacement center system of training be employed within regiments and larger units. This system centralizes training under instructors who are experts, each in his special field. The most competent instructors available in each subject conduct as much of the instruction in that subject as may be practicable. The following methods are among those which may be employed:

- a. "The unit may be passed through a succession of

special training agencies conducted by expert instructors."

- b. "Officers of the unit individually may be given specialized training which they impart to the unit." This may be accomplished by attendance at the Coast Artillery School, through the media of troop schools, or by individual instruction.

- c. "Units may be combined for mass training under selected instructors."

- d. "The personnel of the unit may be segregated according to specialties and each group trained separately by a specialized agency." This method is believed to have great merit in training many of the specialists required in antiaircraft artillery units. For example, a central school might well be operated in each large antiaircraft training center for the training of stereoscopic observers.

- e. "Demonstrations by trained units are a valuable auxiliary means of exemplifying and fixing proper standards of performance."

The replacement center system was prescribed because it will give the results sought most rapidly and because initially there will be a shortage of officers and noncommissioned officers who are sufficiently expert in the various subjects to conduct training of the high quality which is necessary. Hence, if only one expert instructor on antiaircraft directors is available in a regiment, for example, all director crews may be grouped under him for instruction.

The most suitable method depends on many factors, such as the facilities and equipment available, number of trainees and the nature of the training to be conducted. The attainment of the highest standards is essential and this can be accomplished only by competent instructors. While the Coast Artillery School is being used to maximum capacity to produce such instructors, the demand foreseen is greater than can be trained by this agency alone and full use must be made of troop schools to develop others. Where only one competent instructor in an

essential subject is available initially in a unit or training center, others can be developed locally by troop schools.

Centralization of troop schools is recommended wherever there is a shortage of instructor specialists. The greater the centralization, the wider the influence of a single outstanding instructor and the more uniform the instruction. Care must be taken, however, to avoid centralization to the point that the number instructed will exceed the possibility of effective instruction.

Training is a responsibility of command. Commanders of all echelons energize training by organizing and preparing it completely. Decision as to organization of training in a particular subject requires an estimate of the training situation. The Mobilization Training Programs issued by the War Department are guides. They were not intended to be followed rigidly in all situations and may be departed from as required by local conditions. The training should insure a proper and gradual conditioning of the trainees, avoiding undue physical demands initially, but developing eventually ability to endure prolonged and severe physical exertion. Recruits who join a unit after it has started training should be segregated and trained separately until they have progressed sufficiently to participate in unit training without hampering it.

The following Mobilization Training Programs are applicable to the Coast Artillery:

1. MTP 4-1, For Coast Artillery replacements at Enlisted Replacement Centers, 1940.
2. MTP 4-2, For harbor defense regiments, Coast Artillery Corps, at Unit Training Centers, 1940.

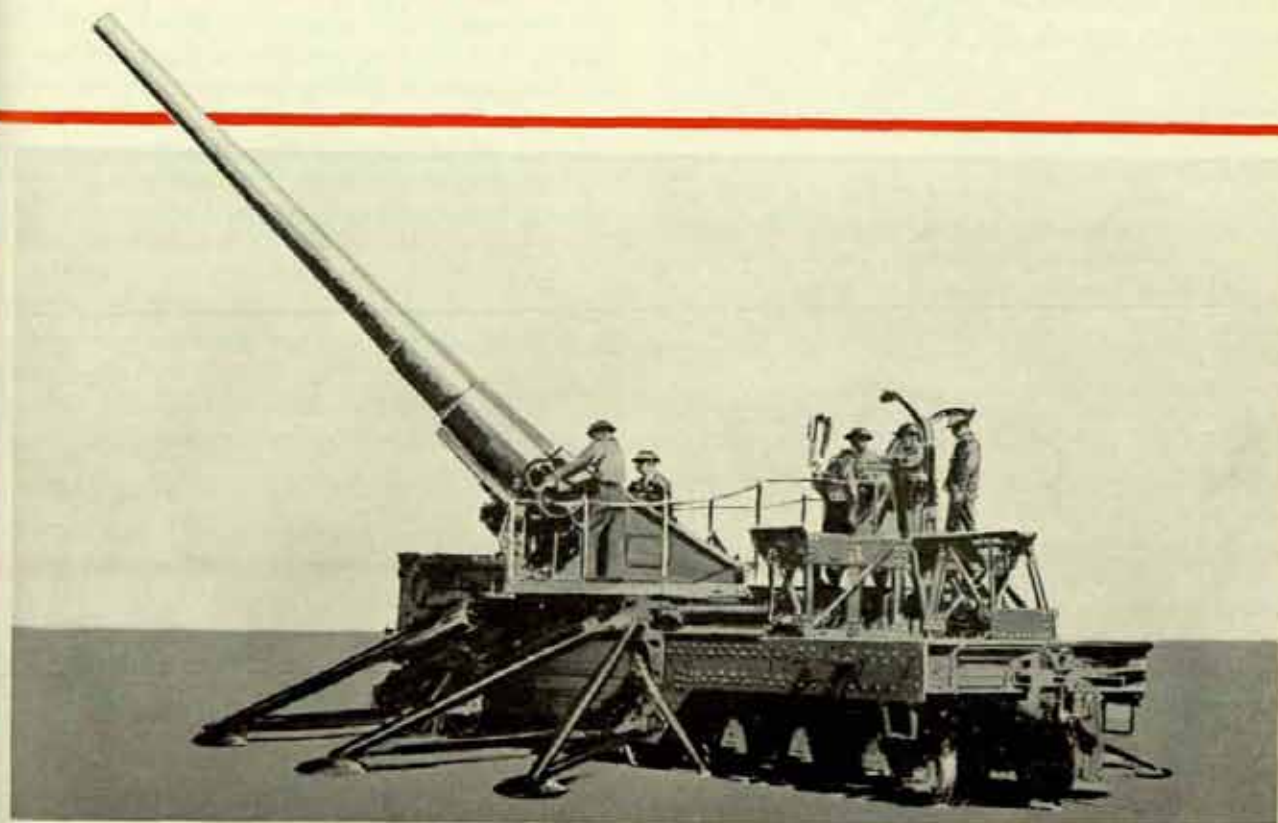
3. MTP 4-3, For antiaircraft artillery regiments (mobile), Coast Artillery Corps, at Unit Training Centers, 1940.

4. MTP 4-4, For railway artillery regiments (excepting 12-inch and 14-inch guns), Coast Artillery Corps, at Unit Training Centers, 1940.

5. MTP 4-6, For 155-mm. gun regiments (tractor-drawn), Coast Artillery Corps, at Unit Training Centers, 1940.

The hours of scheduled training shown in the programs refer to actual training of troops. Preparations for training should be outside training hours as far as practicable. However, it will be necessary to conduct certain troop schools concurrently with troop training in order to prepare instructors for subsequent troop training. Distribution of these programs is not intended to be made to units below the battalion. They are not designed and developed for use in batteries and can not be used by them in their existing form. They must be used by battalion, regimental or training center S-3's because they are in such form as to require much further effort on the part of plans and training officers before the batteries can make out their weekly schedules.

The instructional texts necessary to carry out these programs are listed opposite each subject. These are largely the new field and technical manuals which have been prepared during the past year and most of which have been distributed. Distribution is made by The Adjutant General on a unit basis, due provision being made for headquarters and installations not included in the unit





distribution. Distribution to individuals is not contemplated. Instead, distribution to units and other offices is being made in sufficient number so that wherever an officer is assigned, there will be on hand a sufficient number of the manuals he will need to supply his requirements and those of the enlisted instructors.

Field Service Regulations "constitute the basis of instruction of all arms and services in the operations of war and announce the basic doctrines which are expanded and applied to other texts." Field Manuals constitute the primary means for expanding the basic doctrines of the Field Service Regulations. Technical Manuals consist of a series of pamphlets supplementing the field manuals and include pamphlets describing matériel and containing instructions for its operation and care, texts for extension courses, reference books, instructions for target practice, and the like. Technical regulations, training manuals, and training regulations are being eliminated gradually as the new field manuals and technical manuals become available for distribution. A complete list of Coast Artillery Field and Technical Manuals, with those which have been distributed indicated, appears elsewhere in this issue. It will be noted from an examination of this list that Coast Artillery manuals are designated by the key number 4. This key number is used also to designate Coast Artillery Tables of Organization, Mobilization Training Programs, Training Films and Film Slides. Thus in the designation of FM 4-105, or T/O 4-12, the 4 indicates Coast Artillery and the remaining figures the nature of the subject or unit to which it pertains.

Coast Artillerymen are interested also in the field manuals on subjects common to several arms, which are listed in FM 21-6 and which may be identified by the key numbers above 20; thus FM 21-10, Military Sanitation and First Aid, and FM 22-5, Infantry Drill Regulations, are of interest to all arms. Of interest also are the Ordnance Technical Manuals which cover the Ordnance Matériel with which Coast Artillery units are equipped. It is contemplated that a technical manual will be provided with each new adopted type of major item of ordnance equipment. Effort is being made to prepare them in time for issue with the first production item of matériel to be delivered and it is planned to ship a copy with each item. Drill is, of course, covered in the appropriate Coast Artillery Field Manual.

As a further aid to training, new training films and film slides covering subjects important to Coast Artillery Training are being produced. Some of these are now available and should prove of considerable assistance. Complete lists, with those now available indicated, appear elsewhere in this issue.

Control of unit training is exercised by the Chief of Staff in his rôle as the Commanding General of the Field Forces, through General Headquarters, which has been organized recently and occupies the Army War College building in Washington. Except for such units as are specifically placed under direct command of General Headquarters, such as the GHQ Air Force, command of troops of the field forces has been placed under the Army Commanders. Corps Area Commanders do not now exercise command over troops of the field forces, which include Coast Artillery Districts, including harbor defense troops, but do retain all supply and other functions having to do with construction and maintenance of posts, camps, and stations. The following grouping of Coast Artillery Districts for purposes of training and tactical control has been announced:

- 1st, 2d and 3d Coast Artillery Districts to First Army.
- 4th Coast Artillery District to Third Army.
- Harbor Defenses of Galveston to Third Army.
- 9th Coast Artillery District to Fourth Army.

Control of training by a Chief of Arm is exercised by making appropriate recommendations to the Chief of Staff, by drafting appropriate directives and programs for the approval of the Chief of Staff, through the preparation of training literature and by control of the service school of the arm. Such control is indirect; but nevertheless very real.

* * *

Before a troop can be trained effectively, it must have a proper organization. Closely allied to training is the problem of organization. The preparation of new tables of organization for units of all arms and services was directed by the War Department several weeks ago. Based on this directive, new tables for all types of Coast Artillery units were prepared in my office. These have been approved and distribution should be completed by the time this issue reaches its readers. A complete list appears elsewhere in this issue.

The new tables show only *one* strength, the old dis-



inction between peace and war strength having been eliminated. They provide weapons crews at the full strength required to actually operate and maintain the weapon, but do not include supernumeraries.

Two reliefs have been provided for personnel required to be on duty continually, such as key observers and switchboard operators. An allowance of personnel amounting to ten per cent of the strength required to operate the unit has been added as a unit replacement pool to insure full operating strength at all times. These men are carried as "basics" and are allotted to the various sections for training but are not given specific duty assignments in the tables. Strengths to be allotted Coast Artillery Units initially will not include basics, but it is planned that these will be supplied later. An important change to be effected by the new tables is the inclusion of a mobile searchlight battery in the 155-mm. gun Coast Artillery regiment. Heretofore there has been no provision for the illumination of targets for night firings by these regiments, except in those exceptional cases where they might be assigned to reinforce a harbor defense adequately equipped with searchlights.

In both the railway artillery and 155-mm. gun regiments, the service batteries have been eliminated and a supply platoon has been added to the regimental headquarters batteries. This has proved to be a satisfactory and economical arrangement in the antiaircraft regiment and in units of other arms. Similarly, the battalion combat trains have been eliminated as separate units in the 155-mm. gun regiment and battalion ammunition trains have been included in the battalion headquarters batteries. Each battalion headquarters and headquarters battery (155-mm. gun) will have an allowance of sixteen 2½-ton trucks and sixteen trailers for carrying ammunition, the basis being two trucks and two trailers for each gun in the battalion. In addition, each firing battery is to have an allowance of four trailers for carrying ammunition. These may be towed by the 2½-ton trucks which are to be provided for carrying the personnel and equipment of the gun sections.

In the tables for all units, the battery clerk has been made a corporal and the number of buglers has been reduced to one. Cook's helpers (kitchen police) are provided on the basis of one for each seventy-five men or major fraction thereof and one additional for each ten

officers in an officers' mess. One orderly has been provided per general officer and per regimental or separate battalion commander, one for each two field officers and one for each five company officers or major fraction thereof. Provision is thus made for necessary housekeeping personnel and it should no longer be necessary to detail personnel from the operating sections of units for such purposes.

Numerous changes in grades and ratings appear in most of the tables, the effect in most cases being to provide more adequately for personnel assigned to duties requiring skill and special qualifications. It should be remembered, however, that the actual allotment of grades and ratings may not always be made strictly as provided in tables of organization. The actual allotment may be higher in some cases and lower in others, depending on the availability of funds and limitations of strength. In such cases, the tables of organization should be used as a guide by the unit commander, who will make the suballotment in accordance with local needs.

Within battery units, mechanics are provided on the basis of one for each fifteen motor vehicles. In regimental or separate battalion headquarters batteries, additional mechanics for second echelon maintenance are provided on the basis of one for each twenty vehicles in the regiment or separate battalion. Radio operators are divided between 3d, 4th and 5th class specialist ratings; lineman and switchboard operators have been rated, in most cases, and motorcyclists have been rated.

Two new noncommissioned staff grades appear in the regimental headquarters battery tables, an operations sergeant and a message center chief, both of which will be regimental appointments. Staff sergeants, motor, are provided in batteries having more than twenty-five vehicles assigned and will be regimental appointments. Master, technical, and staff sergeants, motor, provided in regimental headquarters battery tables for second echelon maintenance, will be supplied in the case of Regular Army units, by the assignment of electrician sergeants, automotive, appointed by the Chief of Coast Artillery.

The following tabulation shows the strengths of principal Coast Artillery units as called for by the new tables of organization. Strengths of searchlight and firing batteries and regimental totals are indicated, but battalion and regimental headquarters batteries have been omitted from the tabulation:

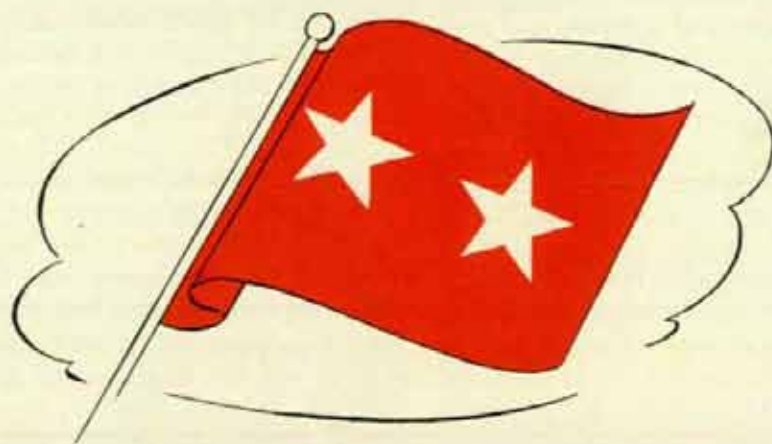
ANTI-AIRCRAFT UNITS

	Gun Btry.		SL Btry.		MG Btry.		37-mm. Btry.		Off.	Total	E.M.
	Off.	E.M.	Off.	E.M.	Off.	E.M.	Off.	E.M.	W.O.		
Regiment, Mobile (1 Gun Bn., 1 AW Bn.)	4	174	5	261	5	176	6	171	69	1	1,807
Regiment, Semimobile (2 Gun Bns., 1 37-mm. Bn.)	4	147	5	248	..	..	6	148	98	1	2,423
Separate Bn., 37-mm. Mobile (4 37-mm. Btrys.)	..	..	..	..	..	..	6	171	33	0	793
Separate Bn., 37-mm., Semimobile (4 37-mm. Btrys.)	..	..	..	..	..	..	6	148	34	0	712
Separate Bn., Gun, Semimobile (1 SL Btry., 3 Gun Btrys.)	4	147	5	248	..	..	..	..	27	0	814

HARBOR DEFENSE UNITS

	SL Btry.		Firing Btry.		Mine Btry.		Off.	Total	E.M.
	Off.	E.M.	Off.	E.M.	Off.	E.M.	W.O.		
Type A (3 Bns.)	4	129	4	153	4	155	68	1	1,784
Type B (2 Bns.)	4	129	4	153	4	155	50	1	1,275
Type C (4 Bns.)	4	129	4	153	4	155	86	1	2,302
Type D (Separate Bn.) (3 Firing Btrys.)	..	..	4	153	..	..	24	0	588
Railway Regiment (3 Bns. of 2 Firing Btrys. each)	..	..	5	197	..	..	67	1	1,642
155-mm. Regiment (3 Bns. of 2 Firing Btrys. each)	4	131	5	180	..	..	74	1	1,765
Mine Planter	..	..	..	..	..	..	2	6	41
Sector Coastal Frontier	..	..	..	..	..	..	14	0	59
Coastal Frontier (2 officers, 97 enlisted men are Coast Artillery)	..	..	..	..	..	..	41	1	171

Much of the information contained in this article is to be found in official directives, manuals and tables of organization. However, it is repeated here primarily for the convenience of officers who are now, or soon will be, directly concerned with the training of Coast Artillery troops.



YOU'RE IN THE ARMY NOW

By Captain Robert J. Wood, Coast Artillery Corps

Today the armed forces of the United States are modernizing and expanding. The strength of the Regular Army has been increased. The National Guard has been ordered to active service. And finally, we have conscription in peacetime and Reserve Officers ordered to extended active duty, in some cases outside of the continental limits of the United States. These measures are a departure from tradition and prove how much the world of 1940 is unlike the world of a few years ago.

Yet, there are many things that have not changed and will not change. Chief among these are the qualifications of an officer, the things which go to make up a military leader.

I, John Smith, having been appointed a second lieutenant in the Regular Army of the United States, do solemnly swear that I will support and defend the Constitution of the United States against all enemies foreign and domestic; that I will bear true faith and allegiance to the same; that I take this obligation freely and without any mental reservation or purpose of evasion; and that I will well and faithfully discharge the duties of the office upon which I am about to enter.

Does John Smith realize what his oath means? Does he realize that his pledge to support and defend the Constitution is a pledge to uphold the principles of democracy upon which this nation rests? Does he realize that no matter how "liberal" his political leanings may be he cannot flirt with any dogma other than American democracy? Does he realize that he is pledging himself to take orders and carry them out regardless of the consequences? And does he realize, finally, the things he must know, the things he must be able to do, if he is to "well and faithfully" discharge his duties?

If he realizes these things and sets his mind seriously to perfect himself in the qualifications in which he may be lacking, he will be an officer worthy of his rank.

Some years ago one of my instructors demonstrated what he was fond of calling the "area" of a perfect second lieutenant. Going to the blackboard, he expressed it in this manner:

- A bility
- R esponsibility
- E nterprise
- A daptability

There is no reason why this criterion should not be applied to all officers regardless of rank, but our discussion will confine itself to the newly-commissioned second lieutenant.

ABILITY

What do we mean by ability? Do we mean that the new officer should have a far-reaching knowledge of his branch, of its arms and armament, of its drill and training, of its customs and courtesies? No, for that would be unreasonable. We mean only that he should have the aptitude, the energy and the capability of obtaining this information. We mean that he should have the desire and the strength, both physical and mental, to become versed in his duties quickly.

We are not a militaristic nation. When war comes we want an adequate army, but in times of peace we are not burdened with a large military establishment. Our professional army keeps abreast of developments in the military world, making its plans for M-Day. In times of stress it uses what it has learned to teach the men who come to it for the emergency. Because we are Americans those men who join the ranks have courage, intelligence and initiative. Our new officers are of good material. They are eager to learn and quick to make use of their learning. They understand that, for the time, they are no longer civilians. Upon them may depend the hope of this country to continue its way of life. They have definite responsibilities and duties. Properly taught, they are apt students.

Recently there arrived, for a new 155-mm. gun outfit, four new Diesel tractors. Busy with the details of regimental supply as well as with a Headquarters Battery, I said to a young lieutenant, two weeks of a year's active duty under his belt: "We've just received some new Diesel tractors. I think you will find a couple of noncoms in the regiment who have had some experience with them. Organize a school from among the motor vehicle chauffeurs and by the end of next week have at least two men qualified as drivers for each tractor."

He saluted and said: "Yes, sir."

There's the kind of lieutenant I've been looking for. He didn't say, "Where are the tractors?" He didn't say, "What noncoms?" He didn't say, "Where are the instruction books?"

Learn your job, your men, your matériel

Nor would the story be complete without relating that when I had time to check on him that afternoon, I found him dusty, greasy, and sweaty, mounted on the driver's seat of a Diesel tractor learning how to drive it himself. By the end of the following week he had a dozen qualified drivers for his four machines.

In a new officer who had never before seen a Diesel tractor, that is ability.

We might also include under this topic a certain loyalty to higher authority and to the job in hand, a certain honesty in dealings with subordinates, a certain cheerfulness in going about the task assigned, a certain pride in the job accomplished. All these are marks of ability.

The newly commissioned officer should learn early that performance is expected to the limit of his capacity. He should not hesitate to put in whatever time is necessary to master his assignment. By learning to obey orders he will learn to give them. He will know that once certain of his men, it is not necessary to tell sergeants how to carry out orders. It is necessary only to state the end to be accomplished and the deadline for that accomplishment.

Our recruit officers should get acquainted with AR 1-5 and 1-10, which contain lists of Army Regulations and an index to them. They should get acquainted with Basic Field Manual 21-6,¹ which lists the new training publications. In addition, they should get acquainted with those Army Regulations, Training Regulations, Training Manuals, Field Manuals and Technical Manuals which are pertinent to their branch, their matériel, and their duties.

Nor should we close this discussion without noting that the official evaluation of an officer's ability is reflected in his efficiency reports. To me it is somewhat disgusting to see an officer who is first, last, and always conscious of his efficiency reports—it is just as disgusting to see one who gives it no thought. There is a middle ground worth locating. The regulations covering the rendition of efficiency reports are contained in AR 600-185.

RESPONSIBILITY

Regardless of his duties, every army officer has a measure of responsibility. The greater his rank, the longer his service, the greater his responsibility. For all government property as it is issued to the service, there is retained on file some officer's signature.

An officer's signature is official and final. His word written or spoken, is his bond. As soon as he learns this fact, our newly commissioned officer has achieved some knowledge of responsibility. He must check the items for which he signs. He must value his signature and use it only when it is necessary. He must choose his words and say officially only that which he knows to be true.

Responsibility for government property then, is a basic responsibility. An officer must become acquainted with certain of the AR 30-series, such as AR 30-3000, "Clothing Money Allowance and Price List of Clothing and Equipage," and certain of the AR 35-series, such as AR

35-6540, "Requisitioning Property," and AR 35-6560, "Receipt, Shipment and Issue of Property." AR 35-6640, "Lost, Destroyed, Damaged or Unserviceable Property" is particularly important. There are others which must be sought out as the occasion demands, for instance AR 310-60, "Tables of Organization, Tables of Basic Allowances, and Tables of Allowances" which prescribes the general character of the more detailed tables which are issued annually or oftener, in mimeographed form.

Another type of responsibility is that relating to the pay of enlisted men. This requires a knowledge of the AR 35-series, such as AR 35-2320, "Payments to Enlisted Men, General," AR 35-2380 and -2400 which cover pay for gunners' qualification and specialists' ratings, and AR 35-5520, "Allotments of Pay." Also required is a knowledge of that document dear to any soldier's heart, the monthly payroll, found in AR 345-155.

While he is at it, the new officer would do well to look up the regulations covering his own pay and allowances. Pertinent information is contained in AR 35-1320, -1360, -1400, -1420, -1620, -1800, -4220 and -4820.

A third type of responsibility is that of keeping military records. Accomplishing Army paper work is an art in itself. If an officer knows where to find the information he seeks and will look it up, he has conquered what otherwise may prove a bugaboo. It is not necessary, nor even advisable, to attempt to remember all the rules. It is necessary to be aware that rules exist and to know where to find them. Captain C. M. Virtue's *Company Administration* is an excellent guide. When in doubt, consult Army Regulations.

Keeping and rendering such reports as Morning Reports, Service Records, Monthly Rosters and Final Statements, is covered by the AR 345-series. Ration Returns are covered in AR 30-2210. Appointments, Transfers, Ratings, Furloughs, Desertions, Discharges and Retirements are included in the AR 615-series, which in general is the series dealing with the duties and privileges of enlisted men.

The final type of responsibility is that of discipline. This differs from the other three types in that, while care of property, pay and records may well become routine jobs the details of which may be left to subordinates, the responsibility for discipline rests with the officer concerned. He can demand assistance in the maintaining of discipline, but the results obtained are, after all, a measure of his constant surveillance.

Of course, the disciplinarian's bible is *A Manual for Courts-Martial, U. S. Army, 1928*. All officers should know and study its contents. Further, they should be certain that the enlisted men understand those Articles of War which are required to be read to them.

Yet, the well-disciplined unit is not often the one in which there is constant recourse to trial by courts-martial. Rather, it is one in which every man understands the potency of preferred charges, but in which this method of punishment is the last resort rather than the usual thing. An organization which knows the responsibility of its

¹Up to date lists of training publications will be found elsewhere in this issue of The JOURNAL.

officers to higher authority knows also its responsibility to its officers.

An officer should realize his responsibility to his superiors, but he should also remember his responsibility to his subordinates and to the army as a whole. He should read and remember the 95th Article of War. He should always be conscious that everything he does, everything he says, are reflections on the uniform which he wears.

ENTERPRISE

Enterprise is the spark of an officer's personality. He may possess the required ability, he may have a full understanding of responsibility, yet fail to be a "complete" officer. His record may be devoid of marks which come from inefficient performance of duty; it also may be devoid of brilliance. He may never have failed to do what he was told, but he may never have thought of doing things without being told. I do not mean that there is no place in our army for the officer whose only virtue is dependability. I do mean that he is not the perfect officer when his dependability lacks the spark of enterprise.

Some officers bear naturally the stamp of tactful initiative, of eagerness to undertake jobs out of the ordinary, of energy to create and attack new problems. Others study their positions, learn what is expected of them, and then produce that minimum plus ideas of their own. Others, satisfied to perform normal duties, suddenly find themselves in situations which require force, drive and energy.

Happily, our service can use all three types. Although there are many who are born enterprising and, we hope, few who cannot show enterprise when the opportunity arises, most of our new second lieutenants fall into the second category. Willing and eager, they are excellent material for the acquisition of enterprise.

How should they go about it?

First, by acquiring that confidence in one's ability which comes with knowledge of one's work. I have already indicated various official publications with which the young officer should achieve familiarity. The little brown-covered, pocket-sized, field manuals which the army adopted a few years ago contain a tremendous amount of information. Last year additional ones were completed, containing the most recent thought of matériel and training. FM 21-6 is the index. A revised edition will be issued shortly. It will be well worth study.

An excellent guide book to an officer's career is The George Banta Publishing Company's *Officers' Manual* by Colonel James A. Moss, a publication known to the Army since 1906 as "Moss' Manual." A new edition appears this fall. Another is the more recent and equally good Military Publishing Company's *Officers' Guide*. The officer interested in his career would do well to acquire one of these books.

The young officer mastering the theoretical end of his profession should not neglect the practical aspects. He should consider the human factor and its place in training. How can gun drill be held so that the men do not feel it is a punishment formation? What are the secrets of a

well-run motor convoy? What makes a range section function or fail to function? How can a mess be made attractive without over-expenditures?

The answers to these questions will not be found in books. Good solutions require observation, practical study and enterprise. An able officer takes an active interest in his men.

The officer acquiring enterprise takes part in post activities. If his talents run along religious lines, there is always need for Sunday School teachers. If he has dramatic or entertainment ability, the opportunity for him to tread the boards usually exists or can be encouraged. If his natural tendency is to be social, he should show an interest in post social activities.

Certainly, if he has any athletic ability at all, he should devote some time to post athletics. Athletics give enlisted men something to do during spare time which might otherwise be devoted to something less healthful. Athletics also improve the physique and the general physical condition of those taking part and teach good sportsmanship. Finally, athletics assist in the development of *esprit de corps*—pride in the organization to which the men belong.

On the wall at the entrance to the old gymnasium at the Military Academy is this inscription:

*Upon the fields of friendly strife
Are sown the seeds,
That, upon other fields,
On other days,
Will bear the fruits of victory.*

Competition in war is similar to competition in sport. True, there are fewer rules, more dreadful consequences. We maintain an army to be prepared for war, hoping we will never have to use it. However, should war come, we want to know how to fight hard, how to fight to win. Athletics are good nourishment for such a spirit.

All other pursuits exhausted, if an officer has time on his hands, he could do no worse than to read some of the books recommended by the War Department. A bibliography has been prepared and will be found in every post library, in a War Department circular, and in both the previously mentioned *Officers' Guide* and *Officers' Manual*. The reading course is divided into five periods, covering twenty-four years. It is designed to give a background of political, social and military history, of tactics, strategy and logistics, and of the art of war as practiced by the great captains.

Naturally, no young officer in these days of army expansion has the time to tackle a twenty-four year reading assignment and hope to foresee an early completion of it. Of course, he might start on the First Period, which covers a period of four years and contains some forty volumes.

However, my advice would be to look over the bibliography and select those books in which one might already have some interest. All of the books listed are good books. One cannot go wrong in reading any of them.

Personally, if I thought I had time enough in the com-

ing year to read only six volumes for military background, I would pick out the following and in this order:

von Clausewitz: *On War*.

Creasy: *The Fifteen Decisive Battles of the World from Marathon to Waterloo*.

Mahan: *The Influence of Sea Power on History*.

Ganoe: *History of the United States Army*.

Upton: *Military Policy of the United States*.

Dodge: *A Bird's-Eye View of the Civil War*.

If I had time to read a few more books during long winter evenings, I would get a good military history of Napoleon. Dodge is considered a primary source, but Johnson produced the best-written, most condensed single volume work. Then I would read a good work on Lee, such as Dr. Freeman's recent biography. Next, something on the French Revolution, on which subject there have been more books written than any other single incident of history. I recommend Madelin. Then I would tackle Steele's *American Campaigns*, Henderson's *Stonewall Jackson*, Hart's *Monroe Doctrine*, Latané's *American Foreign Policy*, and finally, Bryce's *American Commonwealth*.

The suggested titles, of course, are just one man's opinion, but the advantage of gaining a background of military history is not an opinion; it is a fact. The young officer should not be afraid to put in the necessary time. He should remember that good, honest work will accomplish almost any end, even to the acquiring and mastering of enterprise.

ADAPTABILITY

Adaptability is the orientation of the individual—orientation to the life of the Army in general, and to the life of one's branch, one's posts, and one's associates in particular.

Army life has some similarities with, and many differences from, civilian life. Existence on the average post, particularly if the garrison is small, has many things in common with existence in a small village. Everyone knows everybody else; everyone's business is everybody's business; news, rumor, and gossip spread quickly without benefit of newspapers or radio. Of course, at a post, the inhabitants are all working for the same employer, their jobs all tend to complement each other, they are all thrown together in work and in play. Then too, their travels are inclined to make them less provincial as to locality than civilian villagers, but hardly, it must be admitted, any less provincial as to opinions.

Army life makes certain demands on the individual which civilian communities do not know. The young officer will find that his personal liberty may never take the form of license, that his personal opinions must be divorced from his uniform. He will find that his time is less his own, that his duties are apt to run considerably over the eight-hour day.

However, this business of adaptation, like that of ability, responsibility and enterprise, is not so hard to ac-

quire if one puts his mind to it. First of all, the newly-commissioned officer will not be given too many jobs to learn immediately. He will be assigned to a unit, he will be expected to learn something about many duties, but he will be told to concentrate on one thing at a time.

Someone has held that there are only three worthwhile jobs in the army: First sergeant, battery commander, and regimental commander. It is not likely that our young officer will get one of these assignments immediately, though the expansion of our army makes it possible that any officer with experience may soon find himself a small-unit commander. At any rate, regardless of assignment, these rules hold: learn the job, learn the matériel, learn the men.

I have discussed already the necessity of familiarizing one's self with the task in hand and the equipment one has to utilize in its accomplishment. Read the books for the theory. Get out in the field for the practice.

As for knowing the men, here we have the necessity for adaptability. The young officer must learn how to become one of his men and at the same time retain the dignity of his rank. It requires what the French so aptly call *savoir faire*. One "knows how to do" by instinct, by practice, by experience. It is necessary to show an interest in the physical comfort of the unit. It is necessary to visit the mess and see if it is functioning. It is necessary above all to know the men by name and to know the peculiarities of each. General David A. Shanks expressed it well in his *Management of the American Soldier*. This pamphlet explains discipline as applied to the American in uniform, a subject worth studying now that conscription is a fact, and worth practicing if we are to obtain the teamwork which is the essence of victory.

The young officer may further his case both with the men and with his brother officers by considering his personal appearance. The uniform is not just another suit of clothes. The wearing of it should be given attention. Enlisted men never fail to inspect an officer's dress and govern themselves accordingly. The prescribed uniform and how to wear it are covered in AR 600-35 and AR 600-40. How many know how the insignia should be worn on the lapels of the service coat? How many know how to hang on the accoutrements of the field uniform?

The July-August, 1940 number of *The Quartermaster Review* contains an excellent article "Clothing and Equipment Required by an Officer Ordered to Active Duty." Written by Mr. Arthur DuBois, whom the *Review* states is probably the only man in the United States qualified to speak with complete authority on the subject, the article contains authoritative advice. It is accompanied by a number of drawings illustrating proper uniforms and how to wear them. I understand the article may now be obtained from the *Review* in pamphlet form for a small sum.

Once in the proper uniform, the newly commissioned officer should not forget that he has it on. There is no excuse for buttons being unbuttoned, for patched places for pens, pencils, or watch chains protruding from pockets.

And one might well point out here that the regulations contain no authority for wearing a back strap on the service cap.

Adaptability is also attained by learning army etiquette, military courtesy and customs of the service.

Since the time of George Washington, three codes have governed the army. First, the Constitution and the laws of Congress; second, Army Regulations; and third, the customs of the service.

Certain it is that customs are strong. By studying AR 600-10, 600-15, 600-25, and 600-30, the young officer can get a grasp of such things as "Military Discipline," "Rank and Precedence," "Salutes and Ceremonies," and "Honors to Persons." He can read Basic Field Manual, Chapter 1 of Volume I, "Military Courtesy, Salutes, Honors and Discipline," soon to be replaced by FM 21-50. But these publications do not indicate the customs of the service. These must be learned by observation and sometimes by hard experience.

Some customs are learned quickly. It is easy to understand that deference should be accorded to officers of higher rank. The place of honor is on the right and therefore the senior always walks there or sits there in automobiles. It is easy to understand that one must stand at attention when talking to a senior officer. It is easy to remember to take off one's hat in another officer's office and never to lean on his desk while talking to him. Even the letters "RHIP" soon mean something.

Other things come less quickly. It takes some officers years to remember that they should not smoke in a senior's presence unless asked or unless he is doing so. Officers sometimes have to be told not to smoke at officers' calls or at official meetings. Some have never heard that carrying an umbrella just isn't done in uniform.

There are many other peculiarities which the Army has taken for granted so long it is almost forgotten they are customs, for example, the "official knock," which is just one rap as you enter the room for inspection; the use by a commanding officer of the verbs "desire" or "wish" when he means "command" or "order" but which are always understood; the prohibition that a junior never "presents his compliments" when sending a message to a senior; and of course, the eternal use of "sir."

Army etiquette requires that invitations received should be answered promptly and in the same person in which they are issued. Etiquette requires punctuality, and attendance until the guest of honor, if there is one, has departed. It requires one to be sociable, to enter into conversation and to pay some attention to all the guests at the party. It requires the use of engraved calling cards to be left at the homes of officers on whom one may be calling and with whom one is not very well acquainted.

A familiarity then, with conventions and amenities, with courtesy, customs and etiquette, goes a long way towards achieving that adaptability which is essential to complete the "area" of a perfect officer. Remember however, deference is not bootlicking, sociability is not snak-

ing, and that punctuality does not require anticipation.

There are two other items we should consider in closing. One of these includes all that comes under the general heading of finances and insurance.

A young officer must look after his finances if he expects to stay in the service. Officers resign every so often "for the good of the service," meaning, in many cases to protect the good name of the service, to protect its credit and its reputation for paying its bills promptly and for giving checks that are covered by sufficient funds. It is easy to run into debt. An officer's credit is so good that the temptation to buy today and pay tomorrow is always strong. Some officers have found the budget idea indispensable; others protect themselves against their own weaknesses by paying cash only. All that is necessary is a slight mental exercise in arithmetic to determine whether debts will exceed income on payday. It is remarkable how many shirk this exercise.

No officer can really be complete who fails to consider the insurance problem. Fire, automobile, and life insurance are the three most necessary types. All three may be obtained easily and cheaply from companies which sell only to the service. They can also be obtained from a number of excellent civilian companies. However, the newly commissioned officer should become acquainted immediately with the provisions of AR 600-100 which sets forth the rules for government life insurance. He should know that this insurance is available in several types of policies and that the maximum amount is \$10,000. But most important of all, he should know that if he is a reserve officer on active duty for more than 15 days he may acquire this insurance provided he makes application for it within 120 days after being called to duty. If he is an officer of the regular establishment he must apply within 120 days of being commissioned. In either case, after the 120 day period has passed his opportunity to purchase government insurance may be gone for all time.

The last item and the final bit of advice is this: Cultivate a snappy hand salute. The American salute is not easy. Sometimes it is executed in such a way as to make one think of the salute of a certain foreign power characterized by Ernest Hemingway in his *Farewell to Arms* as "not designed for export."

A little care will make our hand salute the most military of any in the world. If fingers are extended and joined, hand and forearm straight, palm flat and forefinger brought snappily up to the brim or visor of the headwear and brought as snappily to the side again, the salute is satisfactory. But the secret of a *superior* salute is the raising of the head and eyes simultaneously with the hand. It is difficult to give a poor salute if the head and eyes are so raised.

So—you're in the army now. Don't forget it. Strive always to do a little more than you are told, learn your job, your men, and your matériel, avoid debt and cultivate adaptability, and you may rest assured that you will be a credit to your country.

By
Lieutenant Colonel LeRoy Lutes
Coast Artillery Corps



Orienting the Recruit

IN these days many officers find themselves responsible for the initial training of large numbers of recruits who will come under military control rapidly but in different groups. Each of these groups should receive some immediate elementary mental preparation for the tasks ahead of them. They will know little of the traditions of military service and there will be but a short time available to teach them.

Twice the writer has found himself in similar situations—once while commanding a large Panama Replacement Detachment in 1919, and again while temporarily in command of the 62d Coast Artillery (AA) in the fall of 1939. At both places nearly a thousand recruits were received during a ninety-day period, and only a few regular officers and noncommissioned officers were available to train them.

To insure that the new men would receive some preliminary indoctrination immediately after their induction into the service, a lecture was prepared, to be read by a noncommissioned officer to each group of recruits. The lecture was short and to the point; it was couched in language so simple that any recruit could absorb some of the ideas.

So successful were the results of this lecture that it is offered here as an aid or guide to those officers or non-

commissioned officers who require a short cut of this kind. Many can improve it or put more punch into it. It will be noted that effort has been made to insert a little counter-propaganda for the few subversive types we are bound to receive. After the lecture is delivered it should be kept fresh in the mind of the soldier by asking him questions about it at each weekly inspection.

THE LECTURE

You are now a member of the military profession—one of the oldest and most honorable callings of man.

The people of your country expect you to be strong physically, to be loyal, to have courage and to live up to the best Army traditions.

If it were not for the soldiers who have gone before us we would not have these United States today.

Officers and soldiers have no politics. This is a democracy. The majority rules. The majority elects a Government. We are sworn to support that Government. In doing that we carry out our military duties to our people.

The Army is a service—not a money-making organization. You are here to give your service to the country. However, your pay is many times greater than the pay of European soldiers. Remember that your pay, food, clothing, medical and dental care costs over \$100.00 per month.

for each one of you. The pay, clothes, food, shelter and all other expenses of our Army come from the taxpayers. Therefore it is our duty to give these taxpayers protection which they expect and to take proper care of the property which they have bought for our use and for the general use of the Army.

Military units are like ball teams. They require coaches who are the officers, team captains who are the noncommissioned officers and the players who are you men. Each officer and soldier is expected to play his part and cut down the number of fumbles and errors. Of course we all make mistakes, but we must try to make as few as possible. Mistakes in the military game cost lives.

Aim to be a professional or major league soldier—not an amateur or bush league soldier.

You will be required to do some things that are strange to you. We will now consider some of these things.

Infantry drill teaches you to coordinate your mind and movements; to be alert; to cooperate with other soldiers in moving together as a team. This is why the drill is done "at attention." Attention means to be alert and ready to receive an order. It is a mark of distinction and indicates good professional discipline if a soldier stands rigidly at attention when he is supposed to be "at attention." A man who raises his hand in ranks or who gazes about when he is supposed to be "at attention" is not as alert as the man who is at attention listening for the next order.

No substitute has been found for this basic training. It is the best method known to man for training the mind and body to proper control. It has been used by military units of all races for thousands of years.

Also you will be taught to salute. Everyone in the army from the highest general to the newest recruit is required to exchange salutes. When an officer or soldier salutes his superior in rank, the salute merely means, "I recognize you as a soldier—here I am also a soldier ready to execute your orders." Officers are required to salute their superior officers and to stand at attention on reporting to senior officers the same as you are.

Both officers and enlisted men are subject to the same military laws and regulations. Most of the laws are cov-

ered in the Articles of War which will be read to you. If you do not understand any of these laws when they are read to you, ask the officer who reads them to give you an explanation.

On duty forget personalities. You may not like your corporal or your sergeant or the lieutenant or the captain. Nevertheless these men are lawfully entitled to give you orders. On a good baseball team you might not like your coach or team captain, but you would play the game for team play. It's the same way in the army. Play the game. It is the professional thing to do.

To protect yourself, obey orders. In most cases orders given to you will be all right—correct and legal. However, if at any time you get an order that you think is unfair or illegal obey it first and then ask to see your captain or lieutenant about it afterward. This will keep you out of trouble.

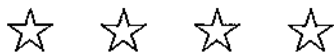
When you go out on work where you are not closely supervised carry out your duty properly. You are being trusted to do it. Besides, you have to put the time in anyway, so why not do a good job instead of a poor one?

Your barracks is your military home. Keep it clean. Respect it as your home while you are in the army. Do not spit on the floor or be untidy and do not let your buddy do it. You naturally want to keep your health. To stay healthy, keep yourself and your barracks clean and sanitary.

Do not tolerate a thief among you. You have to live together in barracks. If you find a man among you who does not respect other people's property, it is your duty to catch him and turn him in for punishment.

Learn to wear your uniform properly, and to look soldierly. The citizens of our country expect it. A soldier is always a marked man and when he wears his country's uniform he should wear it correctly. Do not wear your cap on the back of your head or your blouse unbuttoned. Also have all pockets of your blouse or shirt buttoned.

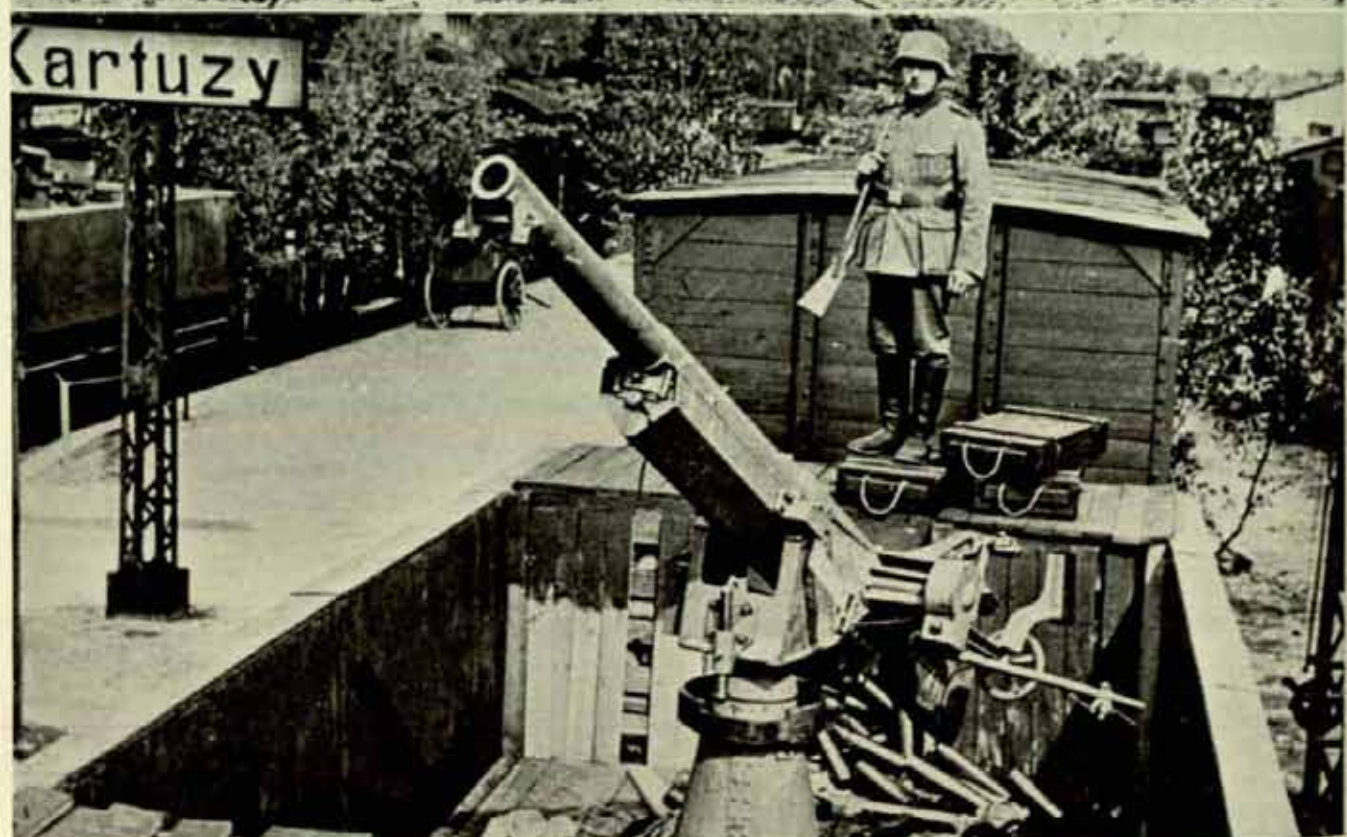
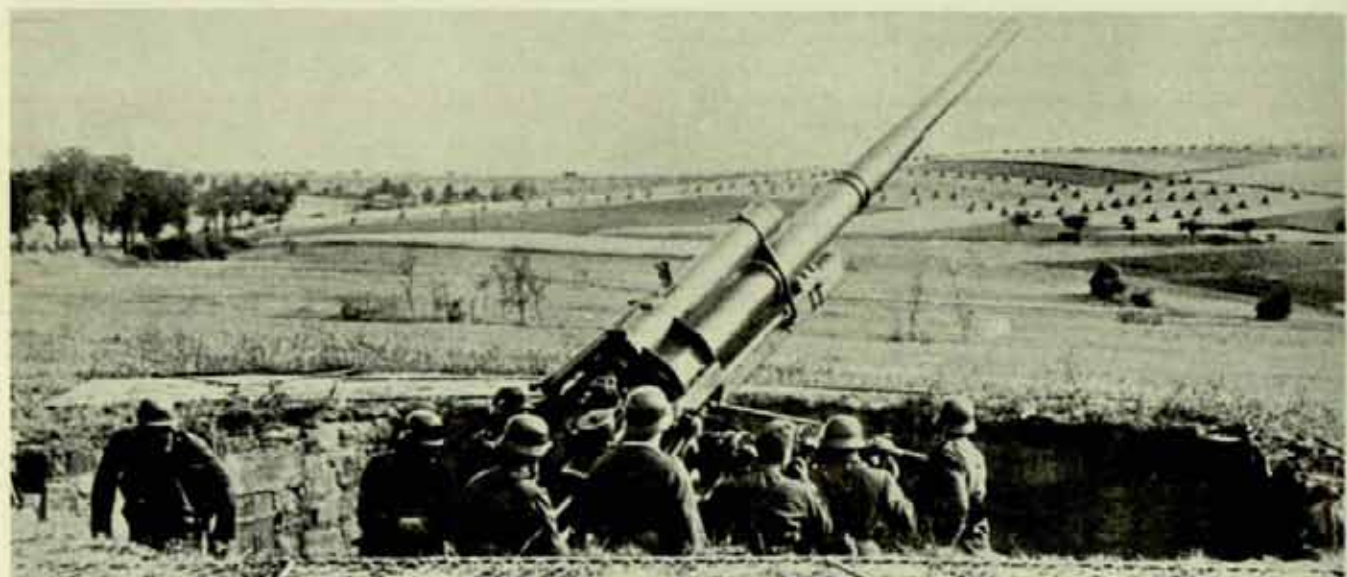
Remember that you will not be ordered to do anything that others have not done before you. In fact, your officers and noncommissioned officers have been through the same experiences, the same work and the same instruction, that you will go through now.



The control of a large force is the same in principle as the control of a few men: it is merely a question of dividing up their numbers.

SUN TZU.

German AA Matériel



Top: Antiaircraft gun position along the Westwall. Bottom: German antiaircraft gun mounted on freight car.



Upper left: Anti-aircraft gun defending Berlin. (Note cover for gun crew in background.) Upper right: What was left of an anti-aircraft gun, used also for antitank defense, when the British captured it at the Somme. Bottom: Light machine gun mounted for anti-aircraft defense.

SECOND ARMY MANEUVERS

By Colonel Fred L. Walker, General Staff Corps

The purpose of the recent Second Army maneuvers was to train the troops of the Second Army Area, rather than to test the organization of units or their equipment as had been the case in many previous maneuvers.

Since training was the principal objective of these exercises the maneuver site was chosen with an eye to varied conditions of terrain. The Sparta, Wisconsin, region has ample wooded areas and numerous roads are available. Rolling and hilly country, low and marshy areas, cultivated lands and numerous streams all combined to insure that terrain diversity so necessary to complete and varied training. The area involved was about thirty-two miles wide and about fifty miles long.

The period of tactical training was divided into five exercises. The first exercise was for battalions, and was allotted two days. The second devoted two and one-half days to regimental training, while the third and fourth took four days and were for divisional training. The fifth exercise, a three-day affair prepared and supervised by Second Army Headquarters, was devoted to training by each army corps. Responsibility for training devolved on the unit commanders concerned.

Infantry and cavalry units of the National Guard were given instruction in combat firing with all types of small arms, and all National Guard artillery units had instruction in field firing for a half day. Early in the training period the 5th Division prepared two demonstrations—one a deployment for defensive combat, the other a deployment for offensive combat. The National Guard and Reserve officers who observed these demonstrations found them quite helpful in later operations.

The armored troops of Fort Knox did not take part in the maneuvers but an improvised mechanized force was employed on several occasions against all divisions in order to give them training in antitank defense. Although units of the GHQ Air Force were detailed to participate, extremely low ceilings prevented their employment.

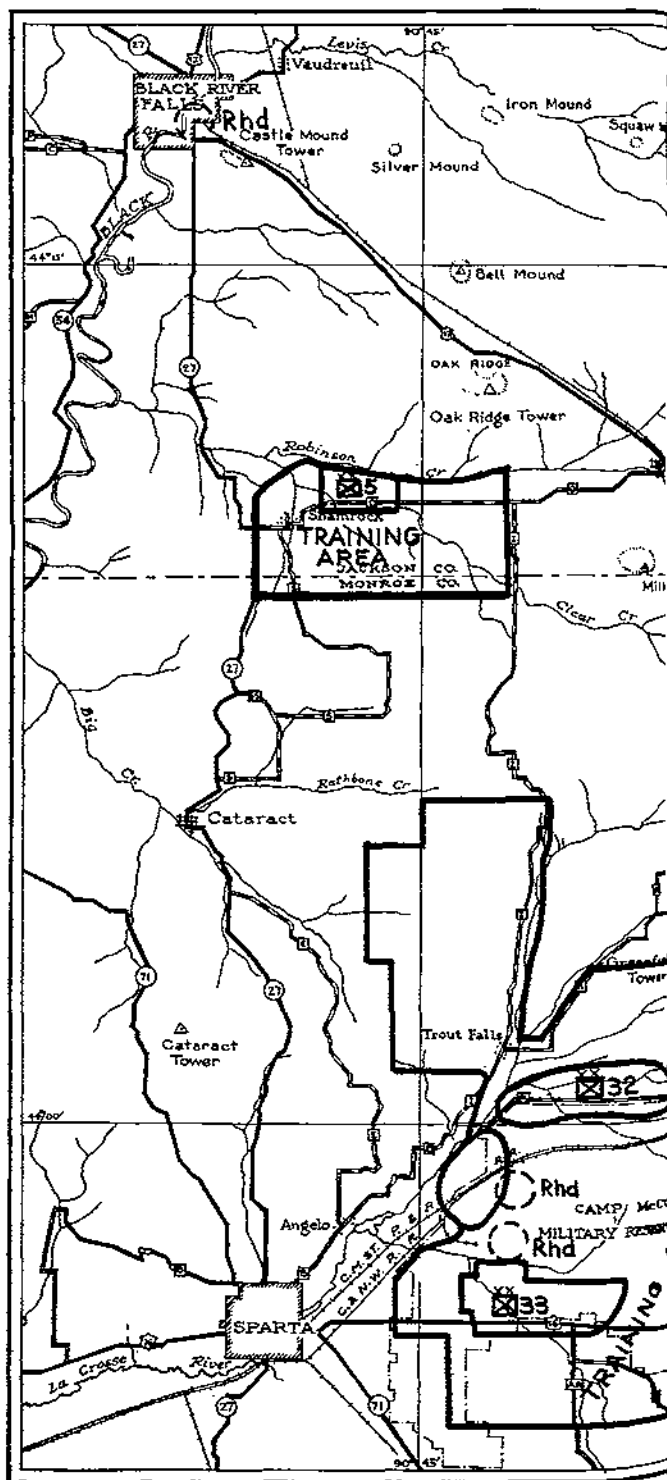
For the last phase of training the V Blue Corps was organized to consist of the 37th and 38th Divisions, plus five battalions of non-divisional infantry and the 54th Cavalry Brigade.

The VI Red Corps had two infantry divisions, the 5th and 33d, and in addition, the 53d Cavalry Brigade, the 182d Field Artillery (155-mm. how.) and the 202d Coast Artillery (AA). The VI Corps had an initial advantage in mechanized forces, with sixty tanks, represented by reconnaissance cars. These were transferred to the other side later in the exercise. The 32d Division, which was assumed to be in the communications zone, was expected to arrive by rail and motor movement in the Sparta area during the nights of August 24-25 and 25-26, when it would reinforce the VI Red Corps.

Exercise Number 5, the main bout of the maneuvers, began at 12:30 P.M., August 24th, with the V Corps,

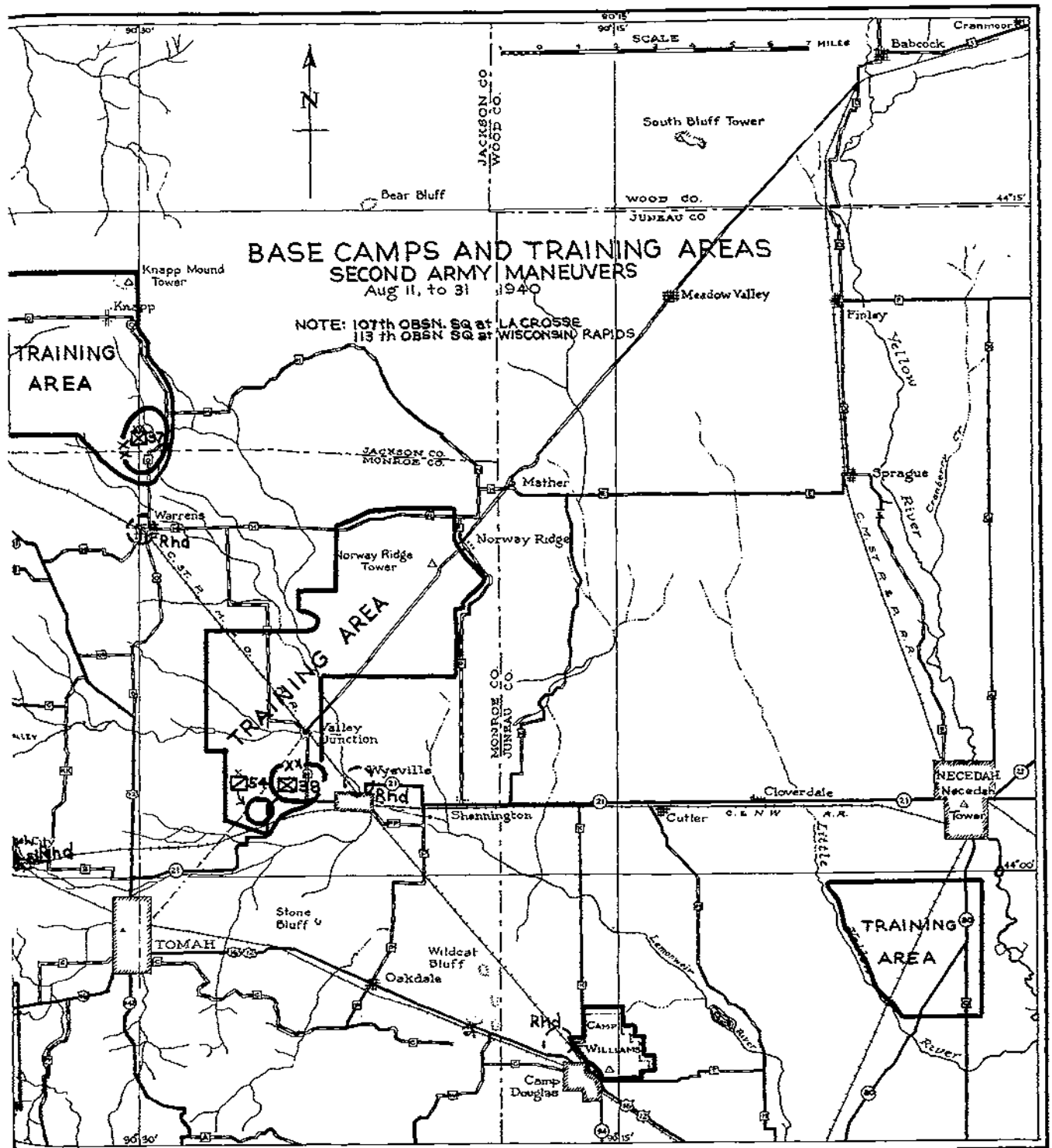
Blue, and the VI Corps, Red, in concealed assembly areas about twenty-five miles apart. Both corps had offensive missions. The V Blue Corps was directed to attack any Red forces found in the vicinity of Black River Falls and drive them west of the Mississippi River. The VI Red Corps was to attack any Blue forces found in the Necedah area and drive them east of the Wisconsin River.

The initial problem resolved itself into seizure of the



assembly positions northwest of Trout Falls. The improvised mechanized force and advance elements of the 32d Division, coming from the communications zone to reinforce the Red forces, arrived in the Camp McCoy area and were protected from air attack by the 202d Coast Artillery (AA). The 5th Division remained at Black River Falls in corps reserve.

It was expected that each corps would devote the day of August 25th to reconnaissance, the formulation of plans and the issuance of orders for operations to be launched on the morning of the 26th. However, neither corps had obtained enough information of the enemy up to the late afternoon of August 25th to permit a proper analysis of the opposing dispositions. August 25th hap-



pened to be a day unsuitable for air observation, yet neither the Red nor Blue ground forces were active in developing the enemy positions and in obtaining identifications. This handicapped the corps commanders, who had little information upon which to base their plans or to furnish to subordinate units in the rear assembly areas.

The threat of the Red mechanized force required construction of road blocks in the V Corps area, and consequently diverted enough strength to cause the Blue forces initially to take up the defensive. However, the V Corps launched an offensive during the late afternoon of August 25th and gained the hill mass northwest of Trout Falls.

On this day the Red VI Corps defended its flanks by constructing road blocks on its left, north of Wildcat Mound and Levis Creek, and by the same measures on its right, south of Highway No. 16.

The 33d Division (Red) was directed to attack to the east on the afternoon of August 25th to secure Purdy Valley Ridge. The 53d Cavalry Brigade (Red), which had been opposing the 37th Division (Blue) was withdrawn during the night of 25-26 August, but no other troops were sent forward to maintain contact with the Blue forces. By 9:00 A.M., August 26th, the 33d Division had succeeded in gaining possession of the major portion of Purdy Valley Ridge.

Earlier, at 6:30 A.M., the VI Corps had issued orders for a coordinated attack to be made at 10:00 A.M., against the Blue V Corps. The 32d Division (Red), now fully arrived from the communications zone, with the 1st Squadron, 14th Cavalry attached, was to attack in the direction of Tomah-Wyeville. At the same time, the 33d was to attack eastward, secure the ground east of Highway No. 12, and assist the 32d Division. The 5th Division from the vicinity of Millston was to attack southeast along highway No. 12 and envelop the enemy's north flank. The 53d Cavalry Brigade was to attack on the left of the 5th Division in the direction of Norway Tower-Shennington and cover the left flank of the Reds.

The Blue plan for the day called for the 38th Division, with 166th Infantry attached, to be reorganized and to re-assume the offensive by division reserves from a position between Highway 12 and Purdy Valley Ridge. The 37th Division (less 166th Infantry) was to hold the line between Knapp and Highway G, a front of about twelve miles. Corps reserve was to include the 8th Illinois Infantry, 2d Battalion 372d Infantry, and 201st Infantry.

The improvised mechanized force which had now been transferred from the Reds to the Blues was to advance at daylight from Camp Williams to Tomah, from where it would move to the attack in three columns. One column was to advance along Highway 12 to the northwest; one along Highway B through Tunnel City to the west; and one along Highway 16 through Tomah to the west.

The 107th Cavalry was attached to the 37th Division; the 54th Cavalry Brigade, less 107th Cavalry was attached to the 38th Division.

At the conclusion of the maneuvers, the Reds had moved their 32d Division to positions south of Tunnel

City. The 5th Division, west of Millston, had moved forward and had succeeded in penetrating the position of the 37th Blue Division by 3:00 P.M. At 3:30 P.M. the 32d Division had reached the northern exits of Tomah, and the 33d had enveloped Purdy Valley Ridge from the north and south. The Blue Corps had regrouped its forces to meet these attacks and at the end of the exercise was working on the plans for a possible retirement.

The lessons of the maneuvers were many, but they all hammered home one truth—the personnel of all components of the Army need more tactical training. Here are some of the conclusions reached from observation of the exercises:

Plans. Every operation should be based upon a definite, complete, and coordinated plan of action, prepared in accordance with the commander's decisions. The plan is made effective by the issuance of field orders. It was noted in some instances that commanders' plans were vague and that the leader concerned did not have a clear conception of what he was trying to do.

Orders. Orders should be carefully prepared by all staffs, and should express clearly the plan of the commander. During these maneuvers many orders were vague and incomplete. Essential elements, such as boundaries between units, direction of the attack and objectives, were frequently omitted. An order must provide for the combined and coordinated action of all parts of the command. Moreover, the order must reach the troops in sufficient time to enable subordinate commanders to make any necessary reconnaissance, to determine upon a plan of their own and to issue their own orders. Time must be allowed for this by higher headquarters. When units are required to execute orders on short notice, they cannot be expected to conduct operations other than in a haphazard and uncoordinated manner. It was frequently noted that many commanders and staffs failed to appreciate this fact.

Supervision. The manner in which orders are carried out is most important. The commander and his staff must personally supervise the execution of his orders. Only by doing this can he be assured that the operations are conducted in accordance with his wishes. There were many instances during the maneuvers in which orders were not carried out in accordance with the wishes of the commander because the commander and his staff did not observe the execution of his order. This applies to large and small units alike.

Troop leading. Many failures in troop leading may be traced to inaccurate or misinterpreted orders. There were numerous instances where unit commanders did not know their own location on the ground or on the map, nor the location of their next higher commander. The need is therefore apparent for frequent and constant day and night training on difficult terrain.

In a number of instances the smaller unit leaders had no conception of their real missions. Unit commanders are responsible for handling their organizations correctly and it is their duty to learn their missions—on their own initiative, if necessary.



Many commanders of small units lost opportunities for training because they gave orders without explaining to their men what they were trying to accomplish and how their operations were being coordinated with neighboring and supporting units.

Reconnaissance. Many commanders did not reconnoiter sufficiently to provide for their own security and to maintain essential contact with adjacent units. Instances were noted where units of opposing forces were close to each other, yet neither knew of the other's presence. Units were moved by night to assembly positions and bivouacs which had not been reconnoitered previously during daylight; confusion and faulty dispositions resulted.

Motor Movements. On several occasions truck columns jammed the roads and were extremely vulnerable to both aircraft and artillery. Motor movements should be carefully planned, properly controlled and promptly executed. A clear-cut understanding of the permissible use of the available road net must be had prior to planning any motor movement. The unit which is to move must know the time of departure, the route to be used, the destination, and the time at which the movement is to be completed.

In their zeal to speed up tactical operations some commanders used all the motor transportation of their units for moving troops. This resulted in inadequate supply of the units. In other cases, units which were to move only four or five miles waited for considerable periods of time for the arrival of truck transportation. In these instances troops could have arrived at their new positions more quickly by marching.

Artillery. The division artillery should not be kept in reserve when the infantry is in action, even though its companion infantry unit is held in reserve. This principle was frequently violated during the maneuver. The amount of artillery organically assigned to a division is the minimum that will be required under the most favorable circumstances, therefore, full use should be made of all of it in order to save infantry casualties. Although committed to action, it can be moved readily if subsequent plans require its emplacement elsewhere. Liaison between the artillery and its front line infantry was not maintained as it should have been. There were times when infantry battalion commanders had no means of obtaining artillery fire support.

Cavalry. Horse cavalry is limited in its operations by the condition of its mounts. Every cavalry commander must look to the future and should keep his mounts in condition for critical events. He cannot undertake all the tasks that he would like to undertake. In these maneuvers, some cavalry units got into tactical difficulties because they disregarded the necessity for maintaining their mounts in good condition at all times, ready for emergencies.

Smoke. There were a number of instances in which smoke was used successfully to obscure the observation of the opposing forces. There are also instances where

smoke was used in a manner that assisted the enemy instead of making things more difficult for him.

Combat Intelligence. Each echelon must search for its own information and must realize that it is a member of a larger team whose leader is entitled to prompt reports as a basis for his own planning. Most units are extremely deficient in this respect.

Signal Communications. Tactical signal communications failed frequently. Many units found themselves entirely without means for rapid communication at the moment when such service was essential. This phase of training must be given greater and constant stress until the deficiency has been corrected.

Supply. Proper supply arrangements are essential to the success of any tactical operation. In some instances, the tactical plan actually had to be modified because of inadequate or unsound supply plans or because supply features were not fully considered at the time the tactical plan was evolved. The difficulties involved in supplying advanced units should be anticipated and plans made for meeting these difficulties; otherwise food and ammunition will not be received by units at the time and place required. Several times during the maneuvers, units went without the evening or morning meal.

Morale. High morale results from the belief of troops that their commanders are competent and capable leaders who will not subject them to unnecessary hardships and who will look after their physical well being under all conditions of the campaign. The few instances of poor morale that were noted resulted from unnecessary marching and failure to receive food. On the other hand, indications of high morale were generally apparent.

Time and Space. One of the outstanding weaknesses in the maneuvers was the almost universal failure to correctly estimate time and space. No commander and no staff officer is worthy of the name unless he is capable of visualizing the composition, operation and capabilities of the unit with which he is associated. He should be able to see the various elements of his command working in cooperation for the success of the whole.

If a commander and staff officer can appreciate the time and space factors that are necessary for each of the elements of the command to accomplish its particular purpose, he will be able to determine time and space factors for the unit as a whole. He will know the extent to which the command will respond to his directives, he will be able to set up objectives which can and will be attained.

Conclusion: Errors and shortcomings have been emphasized because progress in training can be made more rapidly by noting mistakes rather than successes. However, excellent performances by commanders and troops, in both tactical and administrative operations, were by no means rare. Willingness to learn, attention to duty, pride of service, and excellent performance of assigned missions in many cases deserve praise. The principal conclusion to be drawn from the maneuver as a whole is that all components, Regular Army, National Guard and Organized Reserves need tactical training.

Three Million Man Miles By Rail

By Major Samuel H. Edes, 197th Coast Artillery

Rail transportation of a 1,400-man regiment accompanied by its motor transportation, equipage, supplies and armament over lines aggregating 2,500 miles has happened seldom enough in our army since World War I. Add, as special circumstances, that the regiment in question the 197th Coast Artillery, late of New Hampshire, is an antiaircraft outfit equipped with most of its heavy transportation, some of its searchlights, and all twelve of its heavy guns, add again that the accomplishment in some degree measures the capabilities of the National Guard of the United States, and add once more that the whole was accomplished on an exact and rather hurried time schedule, and you have a story.

The 197th claims to be the first National Guard antiaircraft regiment, receiving federal recognition early in 1922. It has the lowest number of any regiment engaged in this line of business. The commanding officer is Colonel Albert E. Colburn, NGUS, graduate of V.M.I., and of the Army's Command and General Staff School. The regiment was ordered into federal service with the first National Guard increment, September 16, 1940, leaving for Camp Hulen, Texas on September 26. In those ten days it was required to accomplish seven rather sizable jobs; to close its ten home stations, to change an open field into an organized camp, to go through the unfamiliar and not-too-simple process of induction, to recruit enough men to cover all losses and bring its strength up to the required 1,400, and finally, to close camp and entrain.

A good newspaperman, Captain Albert S. Baker, was named railroad transportation officer. He soon discovered that material and men to be transported would require 106 railroad cars of various types; thirty-eight standard Pullmans, eight baggage cars, forty-eight 50-foot flat cars, and the remainder, steel box cars. He found that these would be arranged in four trains, and that in loading, certain requirements of safety would have to be met before the railroads could accept the trains. He found that specification of 50-foot cars was important because a 50-foot car would just about accommodate the antiaircraft gun with its prime mover, and that not much space was wasted when two other selected vehicles such as a height-finder truck and a beach wagon were loaded on a single car. He also discovered that the railroad people were most helpful and cooperative.

On Saturday, September 21, the entraining problem was put up to Lieutenant Colonel Arthur L. Smith, commanding the 1st (Gun) Battalion. Colonel Smith found that he had a big job to do; also that he didn't have very much with which to do it. Bear in mind that all this was going on at Concord, New Hampshire's capital, a well-equipped small railroad city, but which has none of the facilities for this special job obtainable at an army post or in a metropolitan area. Everything had to be improvised,

including such indispensables as end ramps, car bridges, blocking, iron braces, stove boxes, and safety devices. First Corps Headquarters sent a man to help fit up the baggage cars as kitchens, but except for that help, Colonel Smith was on his own. He was ready to begin loading Monday morning. The guns and trucks were maneuvered aboard end-on and manhandled along the length of the train into their places. Each truck went on lightly loaded for fear of damage to springs. Each wheel had to be blocked in place with chocks, similar to those used in aviation. These need to be eight inches high for light cars, ten for trucks and guns. The chocks had to be securely fastened to the car platform with spikes, or, in the case of the heavier vehicles, with spikes and bolts. To prevent the vehicles jumping out of these cradles, stout iron rods were hooked around the axles and tied down through the car platform. Sidesway was taken care of by the plentiful use of wire; nearly 10,000 feet were required. All of this material was procured locally and required an outlay of nearly \$2,500. The ramp was purchased and taken along on the theory that facilities at Camp Hulen might prove unequal to the task of unloading—a guess which proved correct.

Once begun, the work was a night-and-day job and, although the weather man did his bit by subjecting the camp and the workers to a terrific rain storm just before the canvas was due to come down, when Wednesday morning was half over train No. 1 was loaded and waiting on schedule, troops safely aboard, kitchens steaming and everybody happy. Two more trains started at about two hour intervals and the rear echelon pulled out at 8:00 P.M. with everything shipshape and well policed.

It is hard to appreciate all the difficulties of this leaving. These 1,400 men and fifty-six officers were leaving home for at least a year's stay and, in the minds of their friends and relatives, very possible war service. So, in spite of a very crowded schedule, time had to be found in which to attend community and individual send-offs and parties. Everybody was heartened by this display of good will but nobody could believe that these entertainments were any great help in the hard labor of getting started.

Once under way friendly greetings were encountered everywhere indicating public approval of what was going on. No attempt at sabotage or hostility appeared at any point, although something of the kind was more or less expected and precautions had been taken. The journey was absolutely without accident or untoward incident. All fastenings withstood the best efforts of various engineers to tear everything apart with bone-jarring starts and stops. The frequent inspections disclosed a few minor troubles requiring first echelon repairs but that was all. Even the four big searchlights, which rode in box cars, did not suffer from the jolting.



Battle Practice

By Captain Milan G. Weber, Coast Artillery Corps

With eight seacoast batteries in position along a shoreline 20,000 yards long, the Harbor Defenses of Pearl Harbor conducted a battle practice along the south shores of Oahu on September 12, 1940. Since many lessons of professional value to the Coast Artilleryman can be learned from the firing of a well conducted battle practice and because the firing of such a practice is not an every-day occurrence, the purpose of this article is to outline some of the steps in the planning and conduct of the practice and to indicate some of the lessons learned.

Paragraph 20, TM 2160-35, states that battle practices will be conducted if ammunition is available. When funds for intensive training became available, Major General Fulton Q. C. Gardner, commanding the Hawaiian Separate Coast Artillery Brigade, ordered that a battle practice be conducted by each of the two Harbor Defenses in the brigade. The primary purpose of this battle practice was to afford to the officers of the brigade experience in firing a number of batteries simultaneously, in concentrating the fire of several batteries or groups on a single target and in shifting the fire of batteries and groups from one target to another. This practice afforded an exceptional opportunity to all concerned to become familiar with many problems which would exist under service conditions, and which would not arise during the normal target practice of a single battery.

With only two tugs available for towing targets, the distribution of the batteries along a 20,000 yard front made it necessary to prolong the practice in order to fully comply with the safety regulations forbidding a battery—target—tug angle of less than 40° . The ammunition allowance of 170 rounds was not sufficient to permit continuous firing by batteries whose safe fields overlapped one another. For these reasons it was decided to divide the practice into phases.

In the planning of this practice, emphasis was placed on timing in order that the desired concentrations would take place. The practice was divided into seven phases, each of which began at a definite time so that all batteries in a concentration could commence firing as close to simultaneously as was consistent with the firing intervals used. The Groupment Commander, Colonel E. B. Walker, maintained close liaison with the tug director and knew the position of the tugs at all times. With this knowledge, he announced, after the end of each phase, the starting time for the following phase.

During this battle practice, the following concentrations of fire took place:

- a. Two 155-mm. G. P. F. batteries.
- b. Two 8-inch railway batteries.
- c. One 8-inch railway and one 155-mm. G. P. F. battery.

- d. One 12-inch barbette and one 8-inch railway battery.
- e. One simulated 16-inch and one 155-mm. G. P. F. battery.
- f. Two concentrations each consisting of one simulated 16-inch battery and two 155-mm. G. P. F. batteries.
- g. One simulated 16-inch battery, one 12-inch battery and one 155-mm. G. P. F. battery.

Insofar as was practicable with the available armament, these concentrations enabled the batteries to gain experience in adjustment when one or more batteries of similar caliber were engaged on the same target. They also enabled all spotters to distinguish between 155-mm., 8-inch and 12 inch splashes.

In order to insure that every battery obtained a proper initial adjustment, each battery was assigned, for the conduct of ranging fire, a target on which no other battery was firing at the time.

Five targets were fired on during the practice. Three of these were towed by the tug *Krauthoff* and two by the tug *Clayton*. The targets on each towline were approximately 100 yards apart. The *Clayton* sailed about 4,000 yards behind the *Krauthoff*. To facilitate the assignment of targets to air and terrestrial observers, the targets were numbered consecutively from front to rear, the three targets towed by the *Krauthoff* being numbered one, two and three while those towed by the *Clayton* were numbered four and five.

One battery fired on four different targets; six batteries conducted fire on three targets; the eighth battery fired on two targets. Thus every battery had to change targets at least once during the course of the practice.

TERRESTRIAL SPOTTING

Bilateral terrestrial spotting was done in the usual manner by all batteries. The chief of spotting section in each battery plotting room or car was careful to note the firing table time of flight and to start a stop watch each time the guns of his battery fired. The command "Ready—

Splash" was given to the spotters approximately one second before the splash was due to occur. Each spotter was thus able to pick out and report the deviations of the splashes pertaining to his battery. Additional data which were used by the spotters to identify the battery's splashes were the size of the splash and the number of splashes in the battery salvo. By means of the time of flight and the size and number of splashes in each salvo, battery spotters had very little difficulty in identifying the splashes pertaining to their own battery and practically all of the 170 rounds fired were identified by the spotters of the firing batteries.

AIR SPOTTING

There are two general methods of using aerial observers for seacoast spotting, i.e., *Method A*, in which each aerial observer is assigned one or more batteries or groups for observation of fire irrespective of the targets fired on and *Method B*, in which each aerial observer observes continuously on all targets in one ship formation regardless of which batteries are firing thereon. The first method is preferable from the standpoint of the range adjusting officer because he can keep his radio receiver continuously tuned to one frequency and does not have to change receiving frequencies when targets are changed.

However, from the aerial observer's standpoint, there are several disadvantages. When batteries of the assigned group are firing on targets towed by tugs 4,000 yards apart it is difficult for the pilot to fly so that the two tugs can be continuously kept under observation by the observer; the difficulties of the observer under these conditions are obvious. Also, the use of this method of observation would frequently make it mandatory for the observer to pick out shots fired on one of the two or three targets towed by the same tug and to disregard shots fired on the remaining targets of the same group. As described below, this is not always possible.

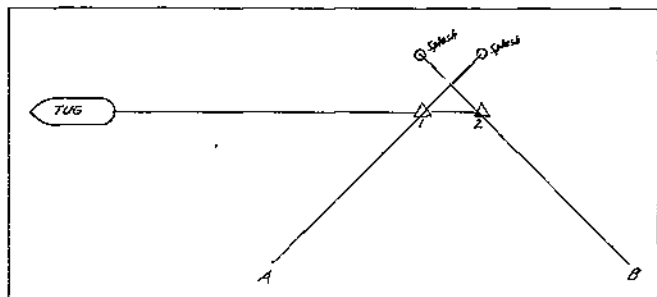
For the above reasons it was decided in this practice to use Method B. Each aerial observer spotted all shots fired on the group of targets towed by one tug and the batteries



Eights and 155's add to the din

tuned their radio sets to a new receiving frequency if the target was changed to one towed by the other tug.

The difficulty in air spotting mentioned above arose from the distribution of the firing batteries. In most previous battle practices, the firing batteries have been grouped in a relatively small area and the approximate battery—target—tug angle was practically the same for all batteries and could be reasonably estimated. In this practice, however, this angle varied from 45° to 135° thus differing in the same concentration of fire by as much as 90° .



It can be seen from the illustration that even with perfect laterals, any splash occurring more than seventy yards over either target in the situation assumed will be closer to the other target than to the one fired on. A similar situation will arise with respect to shorts if Battery A is firing on target No. 2 while Battery B is firing on target No. 1.

It is to be noted, too, that the clock system of reporting deviations does not remedy the situation since the two splashes would be reported as "Three o'clock 100 on target No. 1" and "Three o'clock 100 on target No. 2" whereas the correct deviations should be 140 yards at 1:30 and 4:30 from targets 2 and 1 respectively. In this practice, the perpendicular distance from splash to towline was given to the batteries as the deviation. Knowing the target angle, the battery range section could readily convert this figure to the true deviation.

It is interesting to note that the air spotters were able to report the approximate deviation of the splash as soon as the projectile hit the water. However, to ascertain the size of the splash required a delay of approximately five seconds for the forming of the slick in the water. During this period other projectiles might fall and the reporting of the splashes could become complicated. It is to be noted that the terrestrial observer does not need to bother about the other splashes because he is interested only in the splashes pertaining to his own battery whereas the air observer must spot all shots falling near his group of targets. As a result of the experience gained in this battle practice, it is believed that the most practicable method of air spotting is to have the air observer report the deviation of each shot with respect to the towline (or the extension of the course of the target under service conditions) as soon as the fall of the shot occurs, without regard to caliber.

The air observers (who, incidentally were Coast Artillery Officers) flew in 047B airplanes. The 047B is built

around the observer. Everything in the ship is for his convenience. Facilities for radio tuning are at the observer's fingertips. Seats are available so that the observer can see either over the side of the fuselage or through the transparent bottom. For this seacoast spotting, the lower position was occupied and enabled the observer to spot all shots. Altitudes varied generally from 6,000 to 8,000 feet, and the slant range from the plane to the target varied from about 2,000 to 8,000 yards.

IDENTIFICATION OF SPOTS AFTER PRACTICE

After most practices of this nature it has been difficult and in many cases impossible to match up the deviations reported by the various spotting courses. This has been especially true with camera photographs of splashes. During this practice, two photographers were stationed on each tug. Every time an exposure was about to be made, an enlisted man stationed at the rear of the tug put up a new number in a frame. By means of these numbers, the order in which the photographs were taken was established. Two range rake observers were stationed on each tug and, with their recorders, gave independent records of all shots. In addition to these means of spotting and identifying splashes, each tug officer kept a running record giving his impressions of sequence, deviations, and size of all splashes. Although this was not an accurate record insofar as deviations were concerned, it proved to be a valuable one during the analysis of the practice when the matching-up process took place. A third means of identifying spots was the recording at the visitors' point at Fort Barrette all airplane spots as they were received by radio. These blackboard recordings are shown in one of the accompanying photographs.

COMMUNICATION LINES

In addition to the normal tactical lines between the Groupment Command Post, three Group Command Posts, and eight Battery Command Posts, certain communication lines were set up for the practice which would ordinarily not have been established under service conditions. These included:

a. A telephone line from the Groupment Command Post to the three Group and eight Battery Command Posts for the purpose of synchronizing time in order that the various phases of the practice would be begun simultaneously and the concentrations of fire would take place. A buzzer was superimposed on this line and time signals were transmitted every five minutes.

b. Direct lines from the Groupment and the Group Command Posts to the visitors' stand for transmission of orders and information.

c. A direct line from the radio station to the tug director for direct two-way voice transmission with towing vessels.

d. Readers' and observers' lines from observation stations to a spare plotting room for the use of the tug-directing officer who plotted at intervals the courses of both targets.

e. A direct line from the Safety Officer at Fort Kamehameha to an assistant at Fort Barrette.

RADIO COMMUNICATION

Fifteen commercial all-wave receiving sets were borrowed from private owners, calibrated by a radio sergeant, and distributed as follows:

- One to each firing battery for the reception of aerial spots.
- Two to the visitors' stand for the reception of aerial spots.
- One to the visitors' stand for the reception of communications between the tugs and the tug director.
- Two to the Groupment Command Post for the reception of aerial spots.
- One to the Safety Officer for the reception of communications from the Coast Guard patrol.
- One to the tug director for the reception of communications from the tugs.

Each plane transmitted on a different frequency but received on the same (a third) frequency. Thus, when a battery changed targets from one tow to another, the dials had to be turned to receive on the new frequency. Before the start of the practice, both airplane observers kept up a continuous broadcast for a period of five minutes so that all batteries could mark their dials at the airplanes' frequencies. This procedure facilitated the changing of airplane spotters by the battery when targets were changed during this practice.

ARRANGEMENTS FOR VISITORS

Although this practice was conducted primarily for the instruction and experience of the Coast Artillery personnel, it was realized that a large number of observers would be present. These observers included the Department Commander, Lieutenant General Charles D. Herron, and members of his staff, Coast Artillery officers from other posts, officers from other branches stationed on Oahu, and Navy and Marine officers. For the benefit of these observers, facilities were established at Fort Barrette. The Brigade Commander made available an officer of his staff who was thoroughly conversant with the details of the practice, to act as announcer during the conduct of the practice. This officer kept the observers informed over a loud-speaker system of the batteries which were firing during each phase, the targets fired on, the purpose of the practice, and other items of interest. Three radio receivers at the visitors' stand were continuously tuned in to the frequencies on which the air observers' spots were being broadcast and to all of the two-way voice communications between the tug and the tug director. As stated in an earlier paragraph, all air spots were recorded on a blackboard at the visitors' stand. Although these arrangements for visitors were not necessary for the conduct of the practice, it was found that they added to the spectator in-



Lieutenant General Herron and Major General Gardner at the spotting blackboard

terest and the same arrangements are recommended for all battle practices.

RESULTS OF THE PRACTICE

Fifty-six bow-on and thirty-two broadside hits were obtained from the 170 rounds fired by the eight firing batteries at ranges varying from 7,600 to 14,200 yards. Five of the eight batteries obtained hits during all phases in which they participated. Two batteries obtained hits in all phases except during the conduct of ranging fire.

The practice showed that, when proper steps are taken to insure that the spotters are warned immediately in advance of the fall of shots, the terrestrial observers are able to distinguish their own splashes, and adjustment of fire can take place even though other batteries are engaged on the same target.

Air spotters have no difficulty in immediately giving the sensing and deviation of each shot as soon as the projectile hits the water. To wait for the slick to form so that the caliber of the shot can be identified might lead to complications in those cases where a number of shots are falling at close intervals. When targets are in a very close formation and the firing batteries are distributed along a wide front, the air observer is apt to give the sensings with respect to the wrong target.

After the practice, the Brigade Commander expressed himself, in a letter to the Commanding Officer of the Harbor Defenses of Pearl Harbor, as being well-pleased with the entire practice and stated that the results attained evidenced very careful planning, thorough training, and highly effective team work on the part of all elements of the command. In the opinion of the Brigade Commander, practices of this nature constitute one of the most valuable means of affording practical and intensive training to officers and enlisted men and should contribute materially to preparing them for the duties they would be called upon to perform in war.



THE COAST ARTILLERY IN PANAMA

By Lieutenant Colonel Charles R. Finley, Coast Artillery Corps

November first marked the first anniversary of the Panama Separate Coast Artillery Brigade and of the antiaircraft artillery regiments, the 72d and 73d. It was a memorable year for the largest group of Coast Artillerymen every assembled in peace time or in war time. Originally organized as an antiaircraft artillery brigade, the inclusion of the harbor defense regiments, the 1st Coast Artillery and the 4th Coast Artillery, on February 16, 1940, makes the brigade a truly representative organization of Coast Artillerymen. Antiaircraft weapons of all calibers and types, fixed seacoast batteries including the largest and most modern, railway artillery of like characteristics, and a couple of huge and active mine commands gives this organization the wealth of variety that ordinarily would be included in the experiences of Coast Artillerymen only after many years of service.

At present, the command is called a Separate Brigade. Actually, we have equipment and organizations comparable to those of about eighteen antiaircraft regiments, or six brigades, and to a dozen seacoast regiments as we have known them. Our batteries in the 72d Coast Artillery (AA), for instance are lettered A to X. Unless new regiments are formed quickly, we will have to start a new series of lettered batteries using Greek letters. Battery W or X startles readers of rosters. How would Battery Omega or Gamma appear to a Finance Clerk in Washington checking a payroll?

The arrival of the remaining Panama Canal Detachments is expected to be completed about the time of publication of this issue. Although the first units, the "Orphans of the Storm," suddenly caught in the September, 1939 draft for Panama, came here and lived in unscreened tents while constructing their own barracks at the post to which assigned, other arriving troops will have shelter because the veteran units have been occupied for

some months in the construction of about 250 barrack buildings at the field positions, thereby making available barrack space on the posts.

Although the training opportunities and results have been important, the outstanding feature of the past year to personnel at Panama has been the construction program. After completion of barrack construction on the several posts, the antiaircraft units had about six weeks each in the field at the Rio Hato Gunnery camp, returned to garrison for a few days to move to field positions for extensive field training. Mrs. Anopheles Mosquito can play havoc with strength returns when troops are in unscreened tents in the Panama jungles, so funds were provided for material for screened barracks, mess halls and latrines at each field position. The labor, skilled and unskilled, had to be found in each organization—and was. The buildings rose as fast as material could be obtained from the United States. The rapidity and the excellence of construction may be attributed to three factors—the prefabricated type of construction used, the competition to win the Jarman Trophy (an all-wave radio receiver) by being the first battery at each end of the canal to complete its position, and the natural desire of the men to get out of tent camps, unavoidably messy in the mud of a Panama rainy season.

Centralized control of construction was maintained by one supervising officer on each side of the Isthmus operating a lumber cutting and distributing service. Shops at Corozal and Fort Randolph, each operated by the personnel of one antiaircraft gun battery, cut and sorted lumber to the sizes required for the standard type buildings, and material was distributed as needed and as available. Actual construction was the task of the battery occupying the position. The ability of the men to become capable carpenters, plumbers or what-have-you, as necessity de-

manded, is one of the phenomena of the American soldier.

The variety of tasks encountered and accomplished by units of the brigade inspired a soldier of the new 72d Coast Artillery (AA) to suggest a most appropriate motto for the regimental coat of arms then being designed. "Whatever the Task" was suggested and adopted—actually, it fits all the regiments here. "Jarman's Jungle Artillerymen" is the name the men use for the brigade. The novelty of life in the tropical jungle with its varied wild life has a certain fascination in spite of the mud. There is plenty of opportunity for the men to get three-day passes back to their permanent barracks at their home station, (their "Town House" they call it) but most men return prior to expiration of their pass. Their buddies are out there with a job to do, and they prefer the companionship of "the gang." Each battery position has a small canteen of its own, rations and food are delivered daily, though in places most laboriously. Everybody is so busy in construction work on barracks, utilities or gun emplacements that boredom does not occur to them. They are proud of the work they have done throughout this rainy season, beating the mud, the rain, and mosquitos, and they express a scorn for the "dry season soldiers" like the infantry, field artillery and engineers who remain in garrison life during the rainy season and venture into the jungle only in the dry season.

On June 15, 1940, General Jarman initiated the *Panama Coast Artillery News*, a soldiers' weekly. The *Tropical Oozlefinch*, *Jungle Jitters*, *Panama Panorama* and like suggestions for a title were finally abandoned in favor of the simple, but factual title. It is a forty to fifty page mimeographed booklet, containing news of the Coast Artillery in Panama, and enlivened by clever cartoons. A weekly news letter from each battery is included so that men may keep informed of the doings of their old friends in other units; versifiers send in so-called poetry, and letters or special contributions are received which are rich in real soldier wit. The publication is by enlisted men for enlisted men; it is uncensored and unrestricted except by general instruction. Its principle and most successfully accomplished purpose is to boost and maintain morale, but an important side line is to provide a popular vehicle for inspiring pride and a spirit of competition and for getting instructions and guidance directly to the men in their own language.

The paper calls itself "A Slaphappy Publication"; editorial policy, "Sometimes this, sometimes that"; motto: "Blessed Be He Who Bloweth His Own Horn, For His'n Shall Be Blowed." That tells the story. It is a very successful paper, popular with the men, put out by the men at no expense to the government, and it shamelessly toots the horn for The Panama Coast Artillery Brigade and everybody in it—against the world. In their news letters, units build up friendly but caustic feuds. One correspondent boasting of his unit's recently awarded rating of Excellent remarks in a broadside to a sister battery: "While you were writing Pepsi Cola across the tropical

sky we stayed on the target for hits." The Brigade Commander can feel the pulse of the units by the character of their contributions. It is remarkably evident that the unusually difficult tasks of construction and life in the jungle, and the crowded training schedules are taken in a prideful, can-do, good humored, laughing spirit. The *Panama Coast Artillery News* reflects and helps inspire that spirit.

Almost every known means of transportation except ice skates is in constant use in this command. (Yes, skis—mud skis—have been tried.) We have mine planters, junior mine planters, harbor boats, the ferry boat *General Humphries* formerly of Governor's Island, a fleet of old gasoline-engined and new diesel-engined craft, a flock of yawls, sundry battery or privately owned sailboats and cayucas, railroad locomotives, motor vehicles of all kinds, wagons, wheelbarrows, horses, mules, and bicycles. The men speak of the PCAN (Panama Coast Artillery Navy), the Gatun Squadron, Chagres River Patrol, Atlantic Squadron and Pacific Squadron. The U. S. Navy vessels are spoken of as "The Navy's Navy."

The regiments have about 180 motor vehicles with a large number yet to be delivered. In spite of the apparent limitations on road space here, the trucks pile up greater mileage here than in such travelling outfits as the 62d, the "Gypsy" regiment. Our artillery mission is limited in its requirements for mobility, and we have not far to go, but we go frequently and it seems far when one changes from train, to ferry, to truck, to launch, to boat, to mule-back to reach some positions, especially when the mud is as mud can be in latitude nine. Supply to units in position takes all day and frequently part of the night. We use boats of all kinds, trucks, pack mules and native ponies, and plenty of shanks mare and strong backs. There is not far to go, but the nature of the terrain and our dispositions involve considerable and constant interior movement, as in any operating machine of many parts.

With personnel living close to the batteries in an extended training period, it is possible to maintain a constant condition of readiness to fire. When the Brigade Command Post and the AA Defense Atlantic and the AA Defense Pacific transmits the "Alert" signal, a siren sounds, men drop their saws, hammers, spades, or bed clothes, and rush to their positions. In five minutes or less the "All Ready" report is back to the Command Post.

The proximity of a large Air Corps contingent in Panama provides a readily available source of cooperative missions. Of course, the Air Corps is heavily taxed for equipment and personnel to maintain its own intensive training during the present tremendous expansion, and regardless of close relations and willingness, the antiaircraft artillery cannot obtain nearly the total of flying hours we really need for proper training. The Air Corps has assisted beyond the official requirements by coordinating their own requirements for night flying training so as to coincide with our needs for searchlight practices. The units from the Naval Air Station at Coco Solo have been most cooperative in furnishing planes for tracking, espe-



General Jarman at a searchlight position in the making.



Height-finder site, complete with dugout.

cially at night, and their patrol squadrons provide the Aircraft Warning Service and the Antiaircraft Artillery Defense with frequent realistic situations culminating in simulated attacks upon the Canal. The arrival of units of the fleet is occasionally an opportunity for a seacoast artillery alert. With troops in ignorance of what is coming, the harbor defenses are exercised in the detection and repulse of a simulated naval attack. The mine batteries have what is undoubtedly the most complete and extensive test of materials and men ever attempted in like work in our Army. It was a mine battery soldier who suggested patent rights on the twenty-five hour day and eight-day week.

Prior to the start of the target practice season, General Jarman announced as a policy that:

a. In all practices service conditions would be simulated as closely as safety considerations would permit, and, where possible, the practices would be conducted with units actually in their war positions.

b. All energy and training were to be devoted to the effective handling of the units under service conditions with no effort being expended on devising methods designed for the specific purpose of obtaining high scores. The point was emphasized in lectures and conferences that the purpose of target practices was the training of units for battle, rather than the more or less generally existing tendency of endeavoring to obtain a high score to enhance the individual unit-standing on the list of annual classifications.

It was clear to everybody that the classification of organizations in this brigade would be made principally upon the manner in which existing handicaps were overcome. Few antiaircraft gun batteries here can fire from their normal positions because they are located within inhabited areas. At Rio Hato, Republic of Panama, ninety miles southwest of Balboa, we have acquired a new Air Corps station, which is also the Department Training Center. An antiaircraft gunnery camp was established there for the conduct of antiaircraft gun and machine gun target practices. The following advantages were sought:

1. To permit the most effective use of the limited flying time available.

2. To obtain a 180° field of fire, over water, free of shipping.

3. To permit the closest practicable approach to service conditions.

4. To free organizations from the restrictions and distractions inherent to garrison life and to permit concentration upon gunnery.

A wide field of fire and almost total lack of shipping permitted long courses by the towing plane with sufficient time to allow as many as four gun batteries to fire upon one course. This greatly reduced the flying time required. This end was furthered by having the planes and pilots located right at Rio Hato, with the pilots living and messing with the artillery officers.

Four batteries of mobile guns were emplaced and organizations alternated in manning the batteries. The four units at the guns when a course started did not know which unit, or when a unit, would be required to open fire. Their ability to open fire immediately when clearance had been given was one point taken into consideration in the classification. No attempt was made to obtain exceptionally high altitudes or to await ideal courses. The maximum range obtainable under the weather conditions of the moment was accepted. Frequently, these ranges were comparatively short, but this is a true service condition under the weather conditions obtaining in this department during much of the year.

The machine gun platoons were fired in a similar manner, with five platoons set up, all firing on one course of the target.

All organizations firing were new, most of them had received recruits but a few days before going to the camp. Many batteries were commanded by lieutenants with less than one year's service. In spite of this, the actual results were remarkably creditable. However, it may be interpolated here that brevity of service on the part of the young battery commanders has proved no handicap in this brigade. The enthusiasm and energy of the young officers and their rapid maturing when given responsibility has demonstrated in Panama the truth of the belief that soldiering in a young man's business.

The most glaring deficiency in training was revealed

to be exactly what it has always been in antiaircraft gun firing—inaccurate altitude readings. The Chief of Coast Artillery gave a great impetus towards correction of this defect by two steps, first, the specialized training of a group of young officers who are now available as instructors for height finder observers; and second, the provision of a first class specialist rating in each battery, thereby permitting more adequate incentive for perfection among observers.

The antiaircraft batteries held their annual practices in the week February 26 to March 1. All lights, in war positions were manned and courses were scheduled each night. Batteries had no prior knowledge as to which nights were to be selected by the brigade commander as record practices. No attempt was made to wait for clear nights and consequently higher altitudes. The maximum altitudes obtainable were accepted, as were the conditions of clouds, broken courses and unknown direction of attack. A brigade staff officer acted as plane director and was the only person who knew the direction of the simulated attacks which were varied for each course and came from all angles. The searchlight batteries on the Pacific side, with the advantage of much clearer skies as well as with a well trained, carefully indoctrinated personnel, did excellent work. On the Atlantic side, because of a zero or almost zero ceiling during a large part of the week, with lack of more flying time to permit further attempts, all batteries could not finish all practices, and results were not so outstanding as were the Pacific side practices.

The annual record target practices of the majority of the harbor defense organizations are to be fired during November and December, however, during the early part of the year, practices were conducted by organizations of both harbor defenses under the intensive training program. During May and June, functional firing was conducted of all armament that was not fired during the intensive training firings or scheduled to be fired in an annual record practice. Although these latter firings are prescribed for the primary purpose of testing the functioning of the armament, they resulted in additional training for the organizations concerned as the firings were conducted

at towed targets using the normal fire control and position finding systems.

A general policy was established of conducting all practices under service conditions as near as they could be simulated and remain consistent with safety requirements. Every effort was made to eliminate the old, set, "down the groove" type of seacoast practice. Emphasis was placed on the ability to open fire quickly and accurately as soon as the target was assigned. The courses for all practices of rapid fire armament were planned to give the maximum range change possible.

The use of standard plotting boards with the attendant fire control and communication hook-up is regarded as too cumbersome and inflexible for use of 155-mm. batteries against suddenly appearing and rapidly maneuvering targets. Therefore, all 155-mm. practices were conducted using a so-called emergency system of fire control, consisting basically of one range finding instrument—depression position finder or coincidence range finder—and a small range section of two or three men organized to quickly convert initial ranges into corrected firing data for the guns. Several such methods were tested with a view to determining the system best suited for use in this department.

A special test firing is to be conducted using a fire control system of a major caliber long range battery, with the actual firing being done by a battery of 155-mm. guns. The observation station for this firing will be on an island some 30,000 yards in front of the directing point of the long range battery, and all communication with this station will be radio.

Nearly all harbor defense units have several batteries of various types and calibers to fire. The veterans of these two historic regiments must be versatile to the *nth* degree.

It was intended to conduct regular garrison schools for officers, but this proved impracticable with the continuation of field service. It was most desired to provide elementary training in gunnery and matériel for the great number of non-graduates of the Coast Artillery School we had in the brigade. Consequently, all such officers have been required to enroll for the extension courses, and such studies, com-



Ammunition supply to a Coast Artillery battery.



Mud-defense precautions.



Pet — Jungle Artillery style.

bined with the School of Experience available to everybody and avoidable by nobody in the brigade, are producing truly educated artillerymen.

Special courses of about six weeks in detailed study of the intricacies and care of the M-4 Director (AA) were conducted at the Panama Ordnance Depot with Mr. Robert Bohmfeldt, of the Sperry Gyroscope Company as instructor. Several officers and selected non-commissioned officers from each antiaircraft regiment attended and participated in the disassembling and reassembling of M-4 directors which were being overhauled. The specialized knowledge gained by these men will prove invaluable in this brigade, where directors cannot be put on a truck and sent to the Sperry plant for a minor repair job. There is great value in having Sperry or arsenal trained specialists available for maintenance purposes wherever there are directors and such instruments.

Last year each regiment conducted a height finder school with such talent and matériel as were available. This year Captain M. S. Carter, who took the special course in optical instruments and their use, is here to conduct a brigade school for observers on height finders and coincidence range finders. The first four weeks course was attended by all the regularly assigned observers. This was in the nature of a refresher course for experienced

men. This course will be followed by others, each lasting for twelve weeks, to train replacements and assistants. Frequent check up of the observers is made to insure that the best qualified men are holding the sought-for rating and are capable of producing the results so essential in this keystone of all antiaircraft artillery data.

A Deisel Engine School was held at Fort Sherman to train engineers for the new Deisel engined craft of the Gatun and Chagres River "Squadrons" and of the Mine Command. Warrant Officer John B. May, Engineer of the U.S.A.M.P. *Graham* was the instructor of this course. Dependent as are so many units upon water transportation, our fleet and its personnel daily loom larger in importance to this command.

Batteries here have found the Army Extension sub-course in administration, with Technical Manual 12-250 as a reference book, invaluable in instruction of company clerks and headquarters clerks.

Radio schools, communication schools, director schools, details to Department Cooks and Bakers School, Chemical Warfare School, opportunities to join typists and stenographers schools, along with the schools previously discussed, all combine to give sufficient academic flavor to the Panama School of Experience.

Gunners instruction has been carried on along with the construction program, drills and alerts. Whenever the rain gods cut loose as though for another record in inches per hour and construction work is handicapped even for the amphibious artillerymen, groups of men are seen under shelter of a tent, a mess shack or a lean-to with their gunners' pamphlets and an instructor. Both last year and this year the resulting number of men qualified in examination has been most gratifying. It is to be hoped that under the new regulations appropriations will permit gunners' pay for every man properly qualified.

For some months newly arrived recruits have received but brief basic training before joining the working jungleers. However, with completion of the augmentation program the scarcity of man power has not been so painfully acute. There is a five hundred man camp of framed and screened tents in the Battery Smith-Byrn area of Amador that is being completed. This will be the housing for the Brigade Recruit Training Center where five weeks' intensive instruction under carefully selected officers and noncommissioned officers will process all recruits prior to assignment to duty.

The construction of the permanent barracks and quarters at Forts Kobbe, Gulick, Sherman and Clayton is under way. The new barracks for the 1st Battalion, 72d Coast Artillery (AA) at Fort Sherman will be completed within a few months. The date of completion of the construction on the other posts is anybody's guess, but many now here will have the joy of moving into new barracks and new quarters and will have the responsibility and satisfaction of starting off a new army post. Landscaping, organization and planning will place these new stations among the most attractive in the Coast Artillery. Fort Gulick is located on the highest ground on the Atlantic

side, on a series of hills with a view of Gatun Lake and distant mountains to one side, and from the higher points, the Caribbean Sea to the other side. It will be a very desirable station especially upon completion of the Trans-Isthmian Highway. (Oh yes, that is definitely scheduled to be built this year, believe it or not!) The soldiers say Fort Gulick will be the most desirable post in the Army. They see no possibility for laying out a parade ground among these rolling weeded hills. When in the distant future the submerged or partly submerged trees of Gatun Lake have rotted away, permitting safe navigation outside of the marked channels, this post will be the boatman's paradise.

The new Fort Sherman barracks and noncommissioned officers' sets are located at Chimney Beach where Shermanites have done their swimming for years. The battalion there will be able to hold reveille in bathing trunks and start the day with a plunge.

At Fort Kobbe, the Coast Artillery post will be immediately adjacent to Howard Field, a new large Air Corps station. It will have all the advantages of a large community, with good roads and a ferry, which in time probably will be replaced by a bridge, to Balboa. It is a short run by road to the Pedro Miguel Golf Course; there are swimming beaches close at hand, and the entire hinterland of the Panama interior begins where Kobbe stops. The bulk of the antiaircraft troops on the Pacific side will be located in their own section of Fort Clayton across from Miraflores. The officers' quarters, on high ground, will overlook Miraflores Lake, and the thriving village of Red Tank. With the 33d Infantry, the 11th Engineers, the 2d Field Artillery and probably some day a motorized cavalry reconnaissance troop, the Coast Artillerymen here will be in one of the largest military communities in the Army.

But all that is not for the short-timers now here. Right now there is a great shortage of quarters for families of officers and noncommissioned staff. Numbers of us live in Panama City and Colon at a cost close to if not within our commutation. Satisfactory houses or apartments can be found, although not always immediately as required. Many modern and most attractive bungalows and apartment houses have been constructed in the Bella Vista section of Panama City and in the New Cristobal section of Colon. For arriving officers it is preferable to make hotel arrangements until one can locate quarters that satisfy one rather than to depend upon the taste and judgment of a friend. In fact, it may be better to have one's family come down *after* the selection of accommodations.

Living conditions at battery positions are becoming more attractive every day. Energies formerly spent on construction tasks are turning to beautification of sites and to provision of recreational facilities. Day room space is provided, with varying degrees of completeness and comfort. Boxing rings are appearing; volleyball courts are at most positions and some locations have space for softball diamonds.

Hunting, with shotguns, snates or bare hands, is a favorite sport in the immediate vicinity of many batteries. Bare hands seem to suffice to obtain boas, which have become popular as pets with some—that is to say with some. Never did soldiers have such a variety of pets. At one position, a pet marmoset had broken to the saddle the two battery cats, both of which would travel around camp or in jungle most complacently with the miniature monkey astride the back of the cat. That marmoset died. It is not known whether he came a cropper at a jump or was hit by a polo mallet in an unwitnessed jungle polo match.

Collections of snakes, safe in bottles or alive in person, are growing. Panama snakes so far have been the source of stories tall, long and of infinite variety, usually of the superlative degree, but of no casualties of whatever degree. One battery tells that the guns were not manned during one "alert" because the men were delayed so long waiting for a boa constrictor to cross over the path to the guns. The excuse might have been considered by the battery commander, but on an "alert" later in the day, the men claimed the boa was still crossing the path.

It needs only a slight familiarity with current European events to estimate the essential and primary rôle assigned to the antiaircraft artillery and the seacoast artillery of the Panama Coast Artillery Brigade. There is a definite mission, a definite task for everyone. Everyone realizes he is preparing to fight just as he drills, on the same terrain with an unchanging mission. There is no map problem or summer maneuver unreality involved.

This is a big story here because there is a big job being done by a loyal, willing and large contingent of the Coast Artillery Corps. There are opportunities for young officers for experiences beyond those known to be available anywhere else in the Corps, and beyond those previously experienced by older officers of many years service. Variety of equipment, tasks and opportunities is infinite here. The entire atmosphere in Panama today is growth, progress and expansion. The Panama Canal organizations are constructing the new third locks, new towns, new houses, new roads; the Navy is building new installations; the Army Constructing Quartermaster has underway new posts and new buildings on old posts; new units of field artillery, motorized cavalry, and many new Coast Artillery units have been, are being, and will be organized. One needs to be alert to keep abreast and even more so to lead. Panama today is no place to repeat a foreign service tour comparable to one's memories of that tour years ago in the Philippines, in Puerto Rico, Hawaii, Coblenz or Panama. The leisure hours, the siestas and rest periods in Baguio, Hilo or Peking, veteran units perfect in a groove and untried outside that groove—all are memories. Here today are youth, growth, activity, new units never idle long enough to cut a groove, but with the enthusiasm of youth marking new trails toward any indicated goal.

There is a story here, but it must be lived, not told.

The 503rd Wins Trophy



The 503d Coast Artillery (AA) has been declared the 1940 winner of the Coast Artillery Association Trophy. This award is made annually to the regiment which attains the highest score by a formula developed by the Executive Council, United States Coast Artillery Association, to determine the regiment which has obtained the best record in extension school work. The plan which this year governed the award may be described briefly as follows:

REGIMENTAL TROPHY

1. The Coast Artillery Association regimental trophy is awarded annually to the Reserve or Regular regiment having Reserve officers assigned, that attains the highest figure of merit for the year.

2. The figure of merit will be the sum of the following two components:

- a. The total number of credit hours earned during the year by completed extension school subcourses and command and general staff lessons will be divided by the average strength of the regiment.
- b. The number of officers who earned forty or more credit hours during the year by completed extension school subcourses or command and general staff lessons will be divided by the average strength of the regiment. This quotient expressed as a decimal will be multiplied by 100.
3. a. The average strength of the regiment is the average of its strength on December 31st and on June 30th.
- b. The competition year is from July 1st to June 30th.
- c. A regiment must have a strength of twenty-five or more officers to be eligible for the award.
- d. In computing the component in paragraph 2 a above, no officer will be credited with more than 100 hours.
- e. The term "officer" applies to Coast Artillery Reserve officers only, assigned or attached.
- f. Only subcourses and command and general staff lessons completed while a member of a regiment will be credited to that regiment.
- g. Subcourses must be appropriate to the officer's grade or the next higher grade; that is, for the first lieutenants the 30 or 40 Series; except a colonel or an officer holding a certificate of capacity for colo-

nel, may be credited with any courses approved by the corps area for obtaining eligibility for camp attendance.

- h. Coast Artillery subcourses and command and general staff lessons only will be credited except as authorized in paragraph 3 g above.
- i. The date of issue of a subcourse certificate determines when the hours of credit it represents were earned. The date appearing in the "received from student" column on the lesson assignment card determines when hours of credit were earned for command and general staff lessons.
- j. When subcourses are issued in parts (designated by Roman numerals) such parts shall be considered as subcourses.
- k. Second lieutenants exempted from examinations and tests by Section II, Circular No. 81, War Department, 1936, will not be included in the strength of a regiment nor will correspondence work done by them be credited except as follows: If a second lieutenant, so exempted, completes subcourses during the year totaling twenty hours or more he will be included in the strength of the regiment and his work credited to the unit under the same conditions as for other officers.

It will readily be seen that the plan of award emphasizes the training of the Reserve officer with a view to his ultimate use in an emergency. The organizations competing were not merely piling up credit hours, they were preparing their personnel for the ultimate test of any officer—fitness to take the field. It follows that the Association's award has a definite place of high importance in the Corps' training scheme.

This year's winner of the award, the 503d Coast Artillery (AA), is a Pennsylvania regiment with headquarters in Pittsburgh. It is one of the three Pittsburgh regiments

STANDING OF FIRST THREE CORPS AREAS

Corps Area	Average Figure of Merit
Eighth	49.69
Third	48.41
Seventh	43.03

STANDING OF THE FIRST TEN REGIMENTS

<i>Regiment</i>	<i>Score</i>	<i>Corps Area</i>
1. 503d C.A. (AA)	119.13	Third
2. 508th C.A. (AA)	112.33	Third
3. 507th C.A. (AA)	95.80	Seventh
4. 523d C.A. (AA)	88.61	Third
5. 43d C.A. (Ry)	79.16	Third
6. 925th C.A. (AA)	68.32	Fourth
7. 534th C.A. (AA)	67.09	Fourth
8. 621st C.A. (HD)	65.78	Second
9. 69th C.A. (AA)*	65.00	Eighth
10. 509th C.A. (AA)	59.41	Ninth

*Reserve officer personnel only.

which for the past several years have cornered the first three places for extension school work in the Third Corps Area. The friendly rivalry which has existed among the three Pittsburgh regiments has been a large factor in raising the standard of all, and is one reason that the three regiments have stood at the top in the Third Corps Area.

This year, in an endeavor to improve on past records, the "chain of command" system of control was stressed more than ever in extension school work. Under this system the regimental commander held the battalion commanders responsible for the functioning of their battalions. The battalion commanders in their turn demanded a high type of work from their battery commanders. The battery commanders were responsible for maintaining contact with their lieutenants. In this manner not only was a greater volume of correspondence school work secured, but also commanders became better acquainted with their subordinates. This acquaintance was important in building a better esprit de corps.

The winning of the trophy comes as a fitting climax to the closing days of Lieutenant Colonel Clifford D. Hindle's four year tour of duty as unit instructor of the Pittsburgh regiments. Although the "pay dirt" was dug by the officers of the 503d and by them alone, no one can gainsay the statement that the final victory of one of the Pittsburgh teams in the largest part due to the untiring effort, the broad foresight, the kindly understanding, the firm insistence upon results, and the never-failing co-operation of the Unit Instructor. The four Pittsburgh units placed first, second, fourth and fifth in the national competition.

The history of the 503d has been of a somewhat brief duration. Organized after the war, in 1926, it was assigned Coast Artillery officers living in the environs of Pittsburgh. In general, these officers were graduates of schools other than the University of Pittsburgh,—the 508th being the "Pitt" regiment. Being, therefore, composed of men from many schools and some who entered the Corps through CMTC and civilian extension work, it only adds

STANDING OF THE FIRST THREE REGIMENTS IN EACH CORPS AREA

FIRST CORPS AREA

544th C.A. (AA)	39.19
23d C.A. (HD)*	32.28
606th C.A. (TD)	30.80

SECOND CORPS AREA

621st C.A. (HD)	65.78
533d C.A. (AA)	43.57
513th C.A. (AA)	37.38

THIRD CORPS AREA

503d C.A. (AA)	119.13
508th C.A. (AA)	112.33
523d C.A. (AA)	88.61

FOURTH CORPS AREA

925th C.A. (AA)	68.32
534th C.A. (AA)	67.09
524th C.A. (AA)	28.90

FIFTH CORPS AREA

511th C.A. (AA)	31.06
938th C.A. (AA)	20.60
525th C.A. (AA)	15.37

SIXTH CORPS AREA

61st C.A. (AA)*	41.38
531st C.A. (AA)	38.86
527th C.A. (AA)	29.31

SEVENTH CORPS AREA

507th C.A. (AA)	95.80
955th C.A. (AA)	58.25
527th C.A. (AA)	54.09

EIGHTH CORPS AREA

69th C.A. (AA)*	65.00
624th C.A. (HD)	49.78
969th C.A. (AA)	49.07

NINTH CORPS AREA

509th C.A. (AA)	59.41
14th C.A. (HD)*	51.93
629th C.A. (HD)	30.91

*Reserve officer personnel only.

to its credit that the esprit within the regiment rose to a peak that enabled the capturing of the much desired trophy. Indicative of the fine regimental spirit, is that in its last tour of CMTC active duty training at Fort Monroe last summer, members of the regiment filled all of the positions.

After a few years, the regiment was designated as a Regular Army Inactive regiment, and given an M-day

mobilization date. With the beginning of the European War, a feeling of the necessity for real preparedness acted as an inspiration to carry the regiment beyond its former attainments. Then the blow fell. In 1940, M-day arrived for the 503d. It was inducted, insignia and all, into the Regular Army as the 74th Coast Artillery; but, alas, without any of its old personnel. The officers that were the 503d are now divided between the 1321st Service Unit and the First Battalion, 911th Coast Artillery (P).

Justly proud of his regiment is Colonel Edwin A. Ziegler, the original commanding officer at the time of the regimental organization. He retained this command during the entire life of the regiment, and was transferred to Florida only after the regiment had been called into active service as the 74th CA. Colonel Ziegler's experience as an instructor in the officers' training camp at Fort Monroe during the World War was valuable preparation for his succeeding rôle as regimental commander. In civil life he is now head of the School of Forestry of the University of Florida, and is recognized as a leading authority throughout the United States in this field.

Colonel Ziegler was assisted in his command by Lieutenant Colonel Arvid E. M. Fogelberg, executive officer;

Lieutenant Robert J. Bowser, adjutant; Captain Frank W. Keeley, plans and training officer; Major David R. Douglass, commanding, 1st Battalion; and Major J. W. Crane Remaley, commanding, 2d Battalion.

Worthy of particular note is Lieutenant Frank S. Greer who is the high point scorer of the regiment and winner of the Corps Area individual trophy.

The 503d has been noted for years among the Coast Artillery Reserve regiments of the Third Corps Area for its social functions, both at Fort Monroe and in Pittsburgh. The coöperation and goodwill necessary for a pleasant social time also had its effect in influencing every officer in the regiment from Colonel Ziegler to the youngest second lieutenant to do his utmost to put the 503d on top—where every officer was sure it belonged.

The paradox of a winning regiment that doesn't exist is just one more sign of the turbulent times. The officers who made the record for the 503d Coast Artillery are justly proud of their old outfit, and feel that the 74th inherited a challenge along with their coat of arms—a challenge to win the Knox Trophy, so that the shield will be held high in the esteem of the Regulars as well as the Reserves.

Attention, Subscribers

The failure of subscribers to notify us promptly of changes of address results in annoyance to the subscriber, unnecessary labor and expense to the Association, and trouble for postmasters.

It is impracticable for the COAST ARTILLERY JOURNAL to keep its address file up to date by correcting it according to official orders. This has been tried. It doesn't work.

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Don't Forget!

Aircraft Warning Service Tests

By Major William H. Dunham, Coast Artillery Corps

The mission of the Aircraft Warning Service is to detect and trace the movements of hostile air forces and give prompt warning to our military and naval units, centers of population, industrial plants, and public utilities. These warnings must be timely enough to allow for the completion of active and passive antiaircraft defensive measures. Active measures include the employment of interceptor planes and antiaircraft installations; passive measures may include the employment of blackouts, air raid shelters, fire fighting brigades, and balloon barrages. All of these measures may be more effective if a dependable warning system will afford fifteen to forty-five minutes in going from the routine alert position into action.

There has been considerable discussion and some difference of opinion as to the best method of setting up an Aircraft Warning Service. Experiments conducted in recent years have emphasized the importance of making the maximum use of civilian agencies in operating such services. The relative importance of the types of agencies available will vary in different areas, and all must be considered. This article will treat of the facilities available in the northern part of the Seventh Corps Area and the part each played in the functioning of the entire team during recently completed tests held during Fourth Army maneuvers.

The area organized included all of the state of Minnesota, part of North Dakota as far west as Bismarck, part of South Dakota as far west as Aberdeen, and a strip along the railway line between Minneapolis and Sioux City in Iowa, a total of approximately 100,000 square miles. Several problems peculiar to the area were immediately presented. A section of northern Minnesota is sparsely inhabited, making it difficult to obtain sufficient volunteer observers to cover adequately the entire area. Also, certain areas were lacking in commercial communication facilities in an operating condition. Several nets of industrial facilities required special coordination in order to become adapted to the transmission of "flash" messages to an information center not ordinarily a part of their network.

The organization of the observer net was designed to meet these problems in such a manner as to make the maximum use of existing civilian agencies and facilities and yet obtain full observer coverage. Early in June, 1940, operating heads of railroads traversing the area to be organized were contacted by the author and promised to cooperate. Two power companies approached agreed to play their part in the team. Arrangements were made with the Supervisors of the Superior National Forest and the Chippewa National Forest to have rangers in both forests render reports by means of the forestry telephone system. War Department authority was obtained to use members of the Civilian Conservation Corps in their

widely scattered camps to furnish reports by telephone or radio.

Concurrently, steps were taken to locate observers in the gaps between railroads, power lines, forests and camps. This operation was carried on by the American Legion. It was decided that a suitable density of observers would be one per six miles square. This corresponds to the size of most townships in the area, and simplified locating the observers. Instead of maps, mimeographed forms were furnished each county chief selected by the American Legion. He placed an X in the section of the township plot indicating the location of the observer who would report for that township. (Figure 1.) These forms were very helpful in relocating observers on our master map.

In this connection, the Northwestern Bell Telephone Company made an exhaustive study of all telephone facilities available in the area being organized, and indicated on maps the physical condition and grade of transmission of all telephone lines whether operated by the Northwestern Bell or an independent telephone company.

Information obtained from these maps was of great assistance in making final selection of observers especially where there were two or more names submitted for the same general location.

An idea of the magnitude of the Warning Service Information Net may be obtained from examining the following list of participating organizations:

<i>Name of Organization</i>	<i>Number of Observers</i>
American Legion	2,022
Northern Pacific Railway	161
Great Northern Railway	282
Chicago, Milwaukee, St. Paul & Pacific Railway	262
Minneapolis, St. Paul, & Sault Ste. Marie Railway (Soo Line)	185
Chicago, St. Paul, Minneapolis & Omaha Railway ..	99
Duluth, Missabe & Iron Range Railway	15
Duluth, Winnipeg & Pacific Railway	7
Minnesota & International Railway	13
Northern States Power Company	10
Minnesota Power & Light Company	15
Chippewa National Forest	29
Superior National Forest	44
Civilian Conservation Corps	37
State Forestry Service	50
Total	3,231

The interest displayed by participating organizations was largely responsible for the splendid manner in which the necessary observers were obtained. The promptness with which they responded permitted the entire organization to be drilled so that it was functioning smoothly before the first test with airplanes on August 1st.

The only military personnel used were those operating the information center, which was organized as indicated in the chart below. (Figure 2.) There were three officers

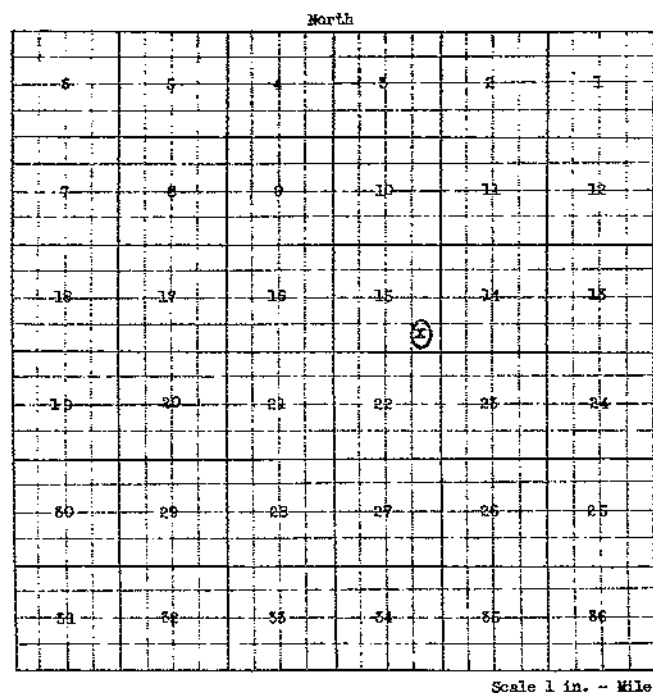


Figure 1

and twenty-nine enlisted men on duty there. Of the twenty-nine enlisted men, six were assigned to the railroad station at Little Falls as telephone operators. Ordinarily these six men would not have been required, but to avoid the necessity for connecting commercial lines to the Northern Pacific Railway line, they were inserted in the chain of communications.

The photographs (Figures 3 and 4) show the Information Center in the Little Falls High School. At the extreme left of the picture (Figure 3) telephone operators seated at a long table are receiving reports from observers. The eight incoming telephones were equipped with light signals to eliminate the noise of telephone bells. As each report was received a runner handed it to the plotter, who is second from the left of the group gathered around the plotting table. White prints of an outline map of the area organized were used for plotting paper. On these prints were shown state boundaries, important cities, air fields, and troop concentrations to be defended. The scale of the prints was approximately one inch to eight miles. Copies were furnished the Air Corps and ground troops with which we operated.

After giving the message to the plotter, the runner moved to the opposite side of the table, received the message form from the plotter, who had completed recording the data, and presented the form to the evaluating officer. The latter indicated at the bottom of the form the disposition of the message. It may be seen by a study of the Message Routing Chart (Figure 5) that every effort was made to reduce the time of receiving, plotting, and evaluating the "flash" messages received from the observer net so that the warning might be transmitted promptly, and so every possible second of preparatory time was made available for defensive measures.

Most messages were sent at once by teletype to the air fields at St. Cloud and Camp Ripley. There the Air Corps officers tracked the airplanes on the white print

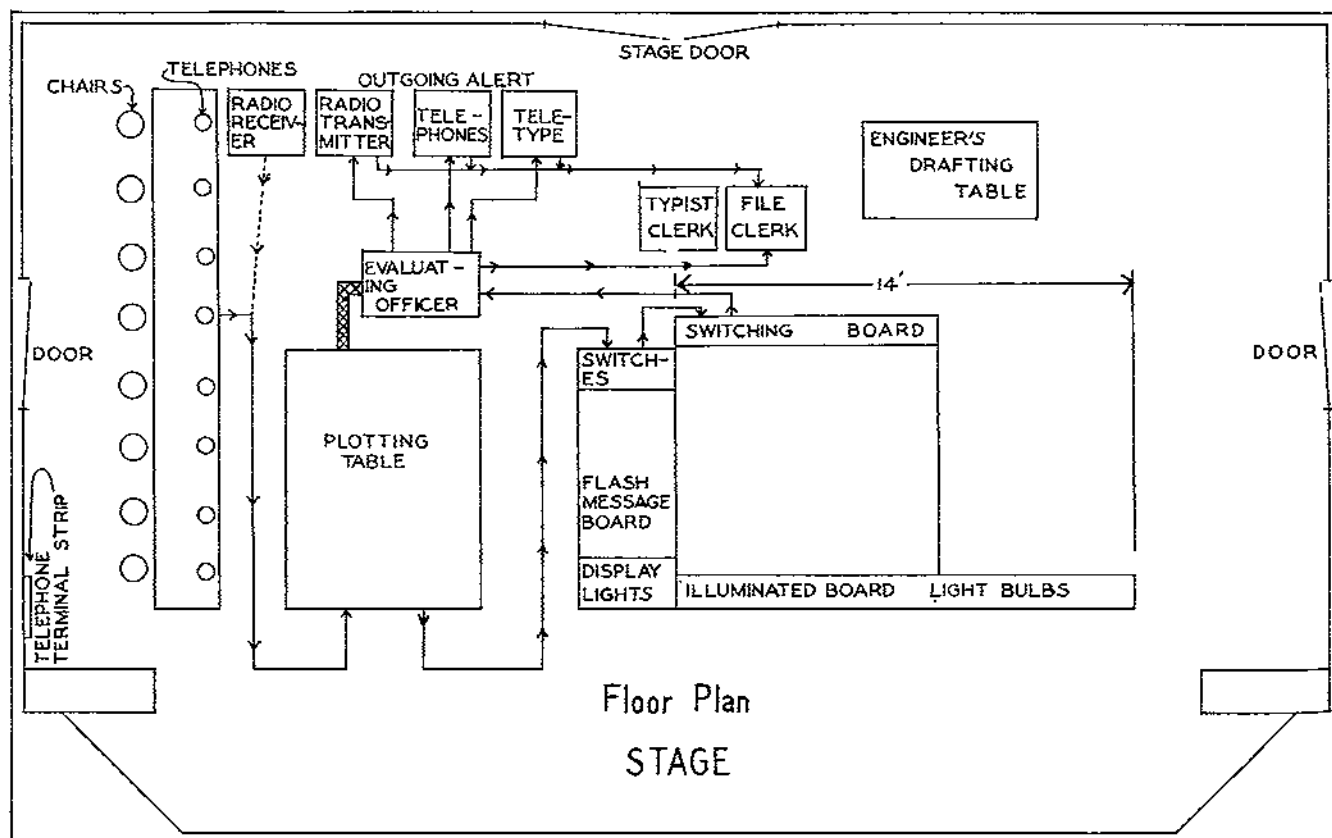


Figure 2

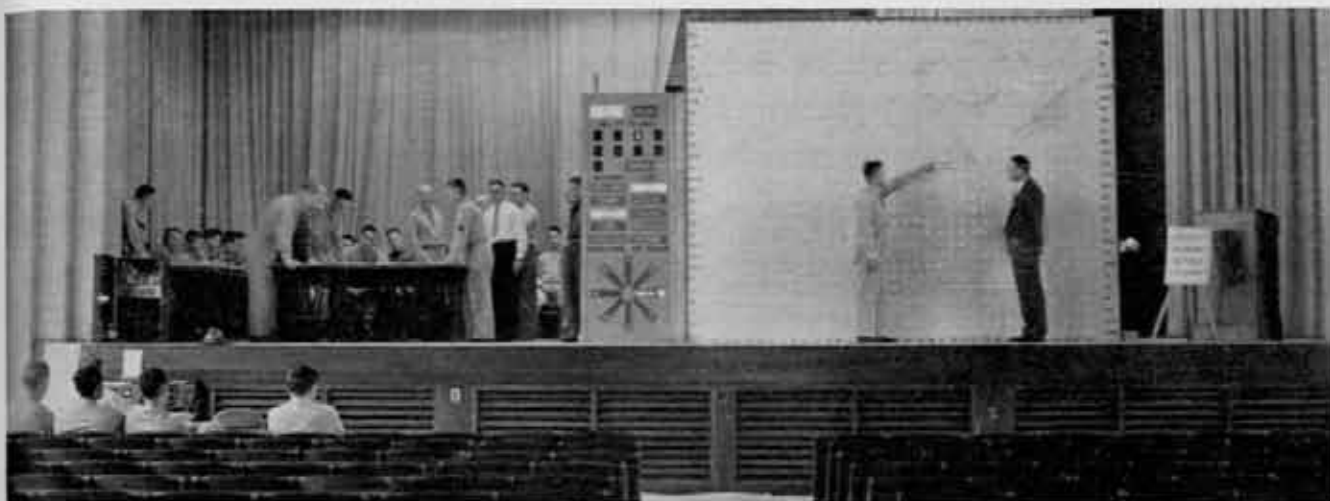


Figure 3: The information center as seen from the auditorium of the Little Falls High School.

referred to above and computed their own interception problems.

Information was sent to the 6th Division by radio as this unit was moving rapidly and no telephone communication with it was possible.

Warnings to civil communities were sent by telephone. The town of Little Falls was a target during each problem and the sound of a screaming siren as the flights of airplanes approached added a touch of realism to the problem.

For the benefit of the visitors, information received in messages was displayed on an illuminated board on the stage. A map behind which small electric lights had been connected, to represent approximate location of observers, operated in conjunction with the illuminated display board. A small flashing light on the map indicated the area from which the flash message had been received. This light continued to flash as long as the message was displayed on the illuminated boards, after which it remained lighted continuously until the end of the problem. Spectators were thus able to tell from the lines of lights what airplanes were flying, the courses followed, and their probable destination.

From the above description of this Aircraft Warning Service problem and organizational plans, it may be noted that the most unique feature was the emphasis placed on the net of railway communications over which messages from railway observers were transmitted. Since the Northern Pacific Railroad had the only railway lines through Little Falls, and had also a private branch exchange switchboard in St. Paul, arrangements were made to have that company coordinate the interconnecting of the Great Northern; Chicago, Milwaukee, St. Paul and Pacific; Minneapolis, St. Paul and Sault Ste. Marie; Chicago, St. Paul, Minneapolis and Omaha; and Minnesota and International railways with the Northern Pacific switchboard.

Some of the messages were transmitted by Morse telegraph from the observer to the switchboard, where they were relayed to the Information Center. Though it is

desirable to eliminate relays, and it is usually possible to do so, it was felt that the additional installations required to accomplish that condition were not justified for this short test. For a permanent setup the necessary connections would be made. It may be stated that except during one test the Morse telegraph proved to be about as fast as the telephone in transmitting messages from railway observers.

The Duluth, Missabe and Iron Range Railroad, and the Duluth, Winnipeg and Pacific Railroad relayed their messages through the Duluth dispatcher and the Virginia dispatcher, using the commercial telephone in the dispatcher's office. There was no appreciable delay in transmitting their messages.

Messages from Superior and Chippewa National Forests were telephoned by observers to the National Forest Headquarters of each forest over their privately operated telephone line. From the Forestry Headquarters they were transmitted to the Information Center over the commercial telephone line.

The Minnesota Power and Light Company sent all reports to the Little Falls Hydro Plant of that company, from which they were telephoned to the Information Center. The Northern States Power Company sent the messages from their observers to St. Cloud from whence they were telephoned over the line leased for the First Observation Squadron to this Headquarters.



Figure 4: Telephone operators at their positions for receiving flash messages. The plotting table in the foreground has been vacated to permit taking the picture.

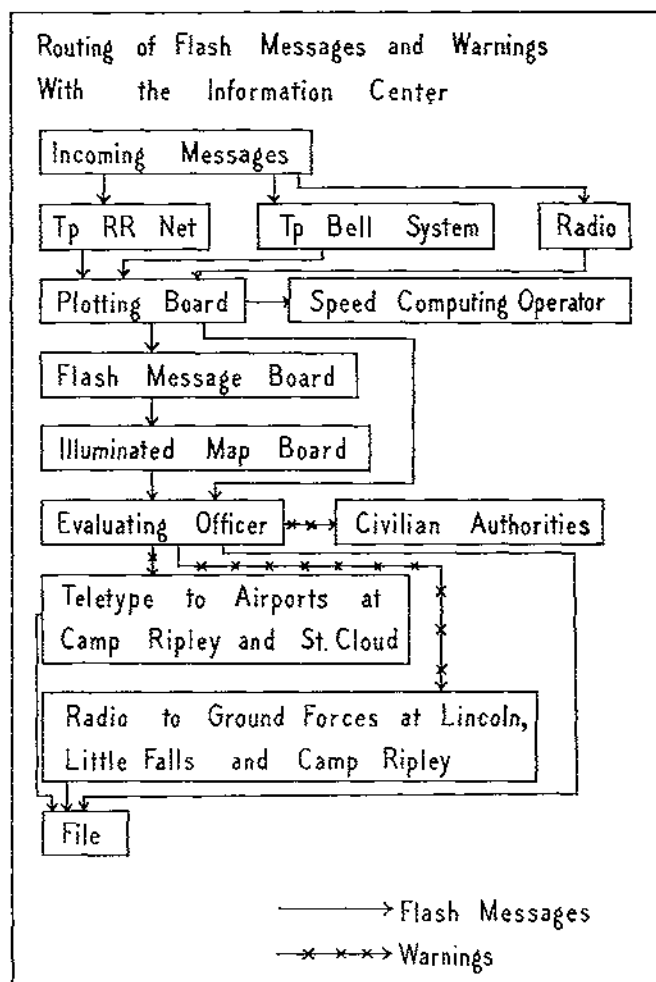


Figure 5

Observers of the Civilian Conservation Corps were prepared to send in reports by radio on 4610 kilocycles or by commercial telephone, when not equipped with radio.

The remaining observers, that is, those selected by the American Legion, all submitted reports directly over commercial telephone lines using the standard flash message form to transmit their reports.

Tests were conducted on July 29th, 30th, 31st, August 1st, 2nd, 3rd, 5th, 7th and 9th. Tests prior to August 5th were preliminary tests designed to familiarize observers with procedure in making reports. On July 29th and 30th railroad tests were conducted using prepared messages instead of airplanes. Each message indicated an assumed time of arrival of three observation planes flying over that observation post. On July 31st and on August 3rd prepared "canned" messages were furnished observers other than railroad personnel for transmission to the Information Center. Only a few observers selected by the American Legion were given prepared messages in order to cut down the expense of telephone calls and still afford an opportunity to check up on the performance of a cross section of that type of observer. On August 1st, 2nd, and 5th, nine observation planes were available each day, so three flights of three airplanes each were flown on those days. With none but railway observers on duty, flights of airplanes were detected and reported on August

1st and 2nd even though bad weather on August 2nd interfered seriously with the observers in North Dakota and South Dakota. On August 7th two flights of three airplanes each were flown in the afternoon, and one flight of three airplanes was flown at night. On August 9th, nine medium bombers (B-18) were made available from the GHQ Air Force, which, with three BC 1 A type airplanes from Kansas City, permitted a total of four flights of three airplanes each on that afternoon. All observers were cautioned to be on duty between 1:00 and 4:00 P.M. on the days of operation, as well as between 8:00 and 10:00 P.M. on August 7th.

The courses flown during the series of tests are indicated in Figure 6.

On no occasion did approaching planes penetrate the net undetected. On two occasions unscheduled flights from other areas cut across our warning net and were tracked for as much as 100 miles at the same time that reports of scheduled flights were also being received.

During the final test which was held on August 9th, the railroads made 151 reports with an average of one and four-tenths minutes per report. The American Legion observers made eighty-eight reports with an average of three and seventh-tenths minutes. It took the Minnesota Power and Light Company two minutes per report to make eighteen reports while the Northern States Power Company reports which had been averaging two minutes dropped to an average of three minutes per report. The National Forests turned in a total of forty-three messages during the series. Their average time for each report was two and six-tenths minutes.

That the performance of railroad personnel was outstanding may be attributed to the fact that railroad officials drew up and issued to their employees instructions based upon information furnished by the Aircraft Warning Service. The Superintendents of Telegraph then made personal checks to be certain that their employees were familiar with the duties required during the tests. Each railroad employee selected as an observer was accustomed to carrying out orders exactly as issued, and was conscious of the value of time. These observers used the means of communication which they employed habitually in transmitting railroad messages and had little difficulty in making the slight changes necessary to transmit warning messages, while still carrying out their duties as railway employees.

While the Union Pacific Railroad took no active part in the operation of the Aircraft Warning Service during the Minnesota maneuvers, that railroad is due great credit for conducting preliminary tests. These tests determined that it was feasible for the Aircraft Warning Service to utilize railroad employees and the vitally important dispatcher circuits without interfering with the normal conduct of railroad business. This information and the instructions given the employees by the Union Pacific Railroad executives paved the way for the formation of the larger railroad net coordinated by the Northern Pacific

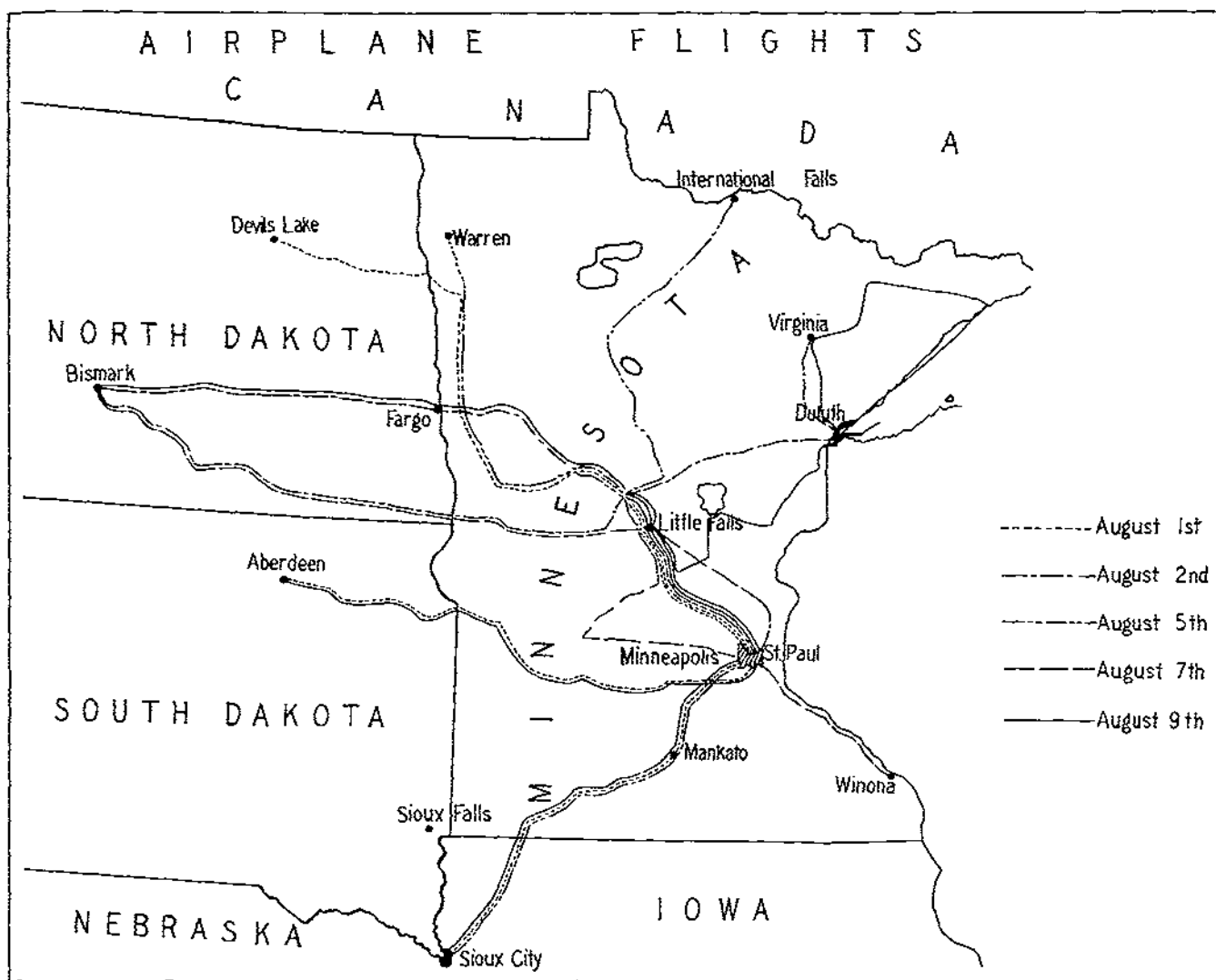


Figure 6

Railroad, tests of which have been discussed in this article.

As the result of these tests, the author has formed the following conclusions:

A network of railroad employees is capable of observing and reporting flights of airplanes passing over the railroad stations in daytime throughout the area tested during this training period. Since the night test was very limited, such a positive statement may not be made with respect to night flights, but experience indicates that observers will be able to hear airplanes flying after dark though they may not be able to identify them.

All railroad stations are not open twenty-four hours a day; therefore, in any system which is to maintain continuous observation, provision should be made for manning necessary observation posts throughout the twenty-four-hour period.

Several of the railroads cooperating in these tests used the Morse telegraph as a means of transmitting reports. Such railroads should be directly connected with the Army Information Center by telegraph so as to eliminate relaying of messages by telephone from any intermediate point. This would require that Morse operators be available at the Information Center.

It is possible for railway companies to organize their employees in a Warning Service Net, and provide them with adequate instructions to perform their duties as observers within two to three weeks.

The remarks referring to the railroads apply equally to the power companies except that it is believed positive measures must be taken to insure that someone outside of the power plants involved is watching and listening for the approach of hostile planes, as the noise of machinery within the power stations is sufficient to drown out the sound of approaching airplanes.

At the present time it appears that a relay of messages from the National Forests is unavoidable as the telephone company does not believe that the National Forest lines can be hooked directly with the telephone company lines and give satisfactory performance. This also seemed to be the opinion of the forestry personnel with whom the matter was discussed.

Radio drill should be carried on between Civilian Conservation Corps observers and the radio operator of the Aircraft Warning Service when practicable. In the meanwhile practice in transmitting and receiving such messages may be obtained by furnishing Civilian Con-

ervation Corps observers with sample messages to be transmitted to the Civilian Conservation Corps radio control station at Fort Snelling.

Some civilian observers need individual training in transmitting type messages over the telephone. It is believed that the only practicable way of obtaining this training is by careful study on the part of the individual observer of all instruction sheets furnished him by the Aircraft Warning Service Headquarters. By practicing the transmission of type messages over the telephone with other observers who live near enough to him, this training may be carried on without resorting to toll calls.

Where possible, wire communication should be used not only in receiving reports from observers but also in transmitting warnings to friendly troops. A spare transmitter capable of sending information on the same frequency as the regularly assigned transmitter should be provided each information center required to send information by radio. (NOTE: On two of the three afternoons when this Warning Service worked with the 6th Division, a transmitter was out of action—the first time it was the 6th Division transmitter, and the second time it was the

transmitter of the Aircraft Warning Service. The latter was much more serious than the former. In the first case, no actual harm was done since messages were transmitted to the Division; in the latter case, while the transmitter was out, no information could be radioed to the Division.)

Personal contact between the officer in charge of the Aircraft Warning Service and the heads of the cooperating organizations is desirable, and must be followed by frequent conferences with executives of such agencies to assure that organization is progressing along the lines necessary to insure proper functioning of the consolidated team.

Though the railroad observers appeared to have uniformly correct time, the same was not true of all observers. Though the message blanks provide for correction of time errors made by observers, the process entailed so much conversation that the matter frequently was dropped, in order to speed the reception of data.

A standard grid system should be adopted for the Continental United States, so that air intelligence may be interchanged by air defense commands using coordinates of the standard system to communicate positions of air craft.





The New Submarine Mine Depot

By Colonel Delmar S. Lenzner, Coast Artillery Corps

In the annals of the Submarine Mine Depot, October, 1940, will always be remembered as the month the depot moved into its own building—a structure designed especially for it. For the first time, the Submarine Mine Depot has now, at Fort Monroe, a building adequate to take care of all space requirements, and moreover a building it does not have to share with other activities.

By Act of Congress approved February 2, 1901, development, maintenance, and operation of the submarine mine defense system, begun by the Corps of Engineers about 1869, was turned over to the Artillery. Headquarters for this activity, originally known as "The Torpedo Depot," were established at Fort Totten, New York, about 1903. The depot offices were located in Post Headquarters, while storage and machine shops occupied a building some 200 yards distant. During this period, the depot personnel consisted normally of one officer, four enlisted men and six civilian employees.

In 1927, this activity was redesignated "The Submarine Mine Depot"; during 1930-31 it was moved to Fort Monroe, Virginia. This move brought the depot into closer physical contact with the Coast Artillery School and the Coast Artillery Board. However, the only location available at Fort Monroe at that time was the storehouse of the local mine command, which the latter was required to vacate. Even after extensive modification, this old mine storehouse, a two-story brick building about 140 by 32 feet, was in-

adequate to house all the activities of the depot. Many of the depot records and considerable property had to be stored in the casemates of the old fort and elsewhere. Departments overlapped in the crowded quarters. Incoming shipments from manufacturers were mixed with outgoing shipments to mine commands. Laboratory, machine shop and storage spaces were all intermingled.

In 1939, funds were appropriated for the construction of a new building especially designed to meet the needs of the Submarine Mine Depot, and work began in March, 1940. The new brick and concrete fireproof building is located east of the site formerly occupied by the old Liberty Theater. It was designed, in collaboration with personnel on duty at the depot, by the Corps of Engineers, and was erected under supervision of the local District Engineer.

The new building is laid out in the shape of a U, approximately 262 feet long by 86 feet wide, with an open court some 22 feet wide between the two wings.

The south end or front of the building (the bottom of the U) centralizes on its second floor the offices, files,

property records, and drafting room. The west wing houses on its first floor the testing laboratory, electrical assembly line, machine shop, welding room and paint shop. The first floor of this wing is paved with wood blocks which not only cushion materially the vibration of moving machinery but also lessen the fatigue of operating personnel. A



Interior of machine shop wing

one-ton electric hoist, which travels the length of this wing on an overhead monorail, facilitates the movement of heavy equipment.

On the second floor of this west wing it is proposed to assemble a collection of submarine mine devices and equipment representative of the various steps in the development of submarine mining from its earliest inception to the present date. In addition to its historical interest, this collection will be available for the instruction of students at the Coast Artillery School, and for the information of present and future depot personnel.

The east wing will be used for storage, as a receiving department, and for the packing and crating of outgoing shipments. The first floor of this wing, designed for heavy storage, is provided with a two-ton three-motor overhead bridge crane. The second floor will be used for light storage. An automatic electric freight elevator connects

the two floors, while a covered bridge connects the second floor of this wing with the second floor of the west wing. A large concrete driveway at the north end, or rear, of the building, and a railroad spur along the east side provide ample facilities for handling truck or rail shipments.

The building is heated by oil-burning steam boilers. It has, in addition to service with the post telephone exchange, a complete intercommunicating system.

The personnel now on duty with the Submarine Mine Depot comprises four officers, one warrant officer, thirty-two enlisted men and ten civilian employees. Included are twenty-one enlisted men, in grades from private to staff sergeant, receiving instruction in the new M-3 mine system. These men will eventually be returned to duty with mine batteries for the maintenance and operation of the new equipment.

CHRISTMAS SEALS



*Help to Protect Your
Home from Tuberculosis*

MINES OF LONG AGO*

By Carlos C. Hanks

"The *Deutsche Allgemeine Zeitung* has published a description of the German magnetic mine now in use and explains how it operates. It admits that mines are being laid by submarines, as well as being dropped from airplanes."—*The New York Times*.

Such a news item as this, coupled with recent recurring accounts of ships lost through mine explosions, indicates that the submarine mine, like other implements of national defense, has advanced so far beyond the horizon of its cruder forebears that little similarity remains save the name and mission.

The stress laid on mining activity in the current European conflict was presaged in 1918 when Captain Reginald R. Belknap's squadron of old cruisers and converted merchantmen laid a North Sea mine barrage that played a great part in curbing the menace of the German U-boats, the first time that mines exerted more than an incidental influence in a naval campaign.

United States Navy men had their first experience with mines, or torpedoes as they were then called, in the Civil War. Farragut risked their danger in Mobile Bay, and a half-dozen Union ships were lost or damaged by their explosive agency. In fact, it is believed the Civil War brought the world's first loss of a war vessel by a mine. The crude mines of 1862 furnished the basis on which the naval scientists of succeeding years built their refinements of the present day when steel hulls magnetically draw the powerful weapons from the depths of the sea to deal their death blows to belligerent and neutral shipping alike.

The Civil War submarine mine was born out of the pressing needs of the Confederacy for some effective method of defending its water approaches, especially the James River, leading direct to its capital city, Richmond. No regular ships-of-war flew the Stars and Bars of the South and its few old-fashioned, brick-and-mortar forts were mostly armed with smooth-bore iron cannon, rusted relics of the past.

A study of historical data gives the impression that the early days of the war provided a golden opportunity for even a single warship to steam clear to Richmond, without encountering serious resistance. For the defense of the rivers, Southerners soon turned to torpedoes, or more properly mines, implements then little known in the military world. Scores of plans were submitted, some advocating mechanical mines which exploded by contact or by timed mechanism, while others urged electrical firing.

The idea of using mines on the Confederate side is generally credited to S. R. Mallory, Secretary of the Navy, and he detailed Captain M. F. Maury to make experiments. The latter's work began in the spring of

1862. At that time the Federal Government had no interest in mines since no problem of underwater defense existed as it was dealing with a foe minus a navy.

The experiments of Captain Maury consisted of submerging and anchoring a series of hollow, spherical shells of iron, containing about 50 pounds of powder, in a line across a river with a connection of insulated wires to galvanic batteries ashore. Fuses were placed within the shells to be ignited by the passage of the current through a fine platinum wire.

It was expected that the explosion of these shells under a passing vessel would destroy the ship and all on board, but experiments soon proved that 50 pounds of powder exploded in from 10 to 15 feet of water would do no harm. In a short time the whole layout was badly disarranged, the wires broken, and some of the iron shells lost by a fresher.

Captain Maury was succeeded by Lieutenant Hunter Davidson, who established headquarters on a small steam tug, the *Torpedo*. In the cabin of this tug experiments were continued and finally a system was formulated, after attainment of a primary object, that of creating a sensitive fuse of fulminate of mercury, to be exploded by the incandescence of fine platinum wire by means of an electric current.

This fuse, as finally evolved, was a piece of quill, half an inch long and filled with fulminate of mercury. Each end was sealed with beeswax, after a fine platinum wire had been set through the center of the quill. The protruding ends of this platinum wire were connected with insulated copper wire. A red-flannel cartridge bag filled with rifle powder then enveloped the fuse. The whole then was ready to be placed in a tank containing cannon powder.

The tanks were made of half-inch boiler plate. There was an opening to pour in the powder and to receive the fuse. The opening was then fitted with a screw plug with two holes for the passage of the wires, and packed with greased cotton waste to prevent leakage of water. There was a heavy ring on the bottom of the tank through which was passed a heavy iron chain of the desired length. A mushroom anchor completed the assembly.

The magnitude of the difficulties encountered by those officers responsible for the development of Confederate mine operations may be illustrated by recounting that there was only about 4 miles of insulated copper wire in the entire Confederacy and they could obtain only about 4 or 5 feet of fine-gage platinum wire. Battery material and cannon powder were scarce, and acids could be obtained only from the small quantity in the stocks of the druggists at the time war broke out.

Three of these mines, each containing 150 pounds of powder, were planted in the Rappahannock River, below

*From "Naval Institute Proceedings," November, 1940.

Port Royal, in the hope of destroying some passing Federal gunboat. The operation was revealed to the Northerners by a runaway slave and no attempt was made to run the cordon.

These mines were exploded by the Confederates themselves in hastily salvaging some of the wire as the Army of the Potomac's advance on Fredericksburg compelled the mining party to retreat.

A new station was established on the James River some 5 miles below Richmond. Two tanks, each containing 1,000 pounds of powder, were submerged in 12 feet of water and connected with a battery concealed in a small hut in a deep ravine. The battery wires were led up a hill to a look-out station where the man in charge could see any vessel approaching.

After several days of monotonous waiting a Federal gunboat came along. The man on watch did not see the United States flag until the ship was quite near. When he did realize a war vessel was approaching he lost his presence of mind, and fired one of the tanks when the gunboat was still some 30 yards distant.

The explosion tossed a column of water aloft and the gunboat buried her bow in the great wave. Her guards were smashed and a half-dozen men were swept overboard. The steamer turned, picked up her men and retreated down river. She passed over the second mine while maneuvering, but the watchman had been so astonished by the first explosion that he ran from his post.

The near success of this attempt firmly established the Torpedo Division in the esteem of the Confederate Navy Department, and created much excitement throughout the South for it was realized the explosion had prevented a Federal gunboat from reaching Richmond.

Other stations were established lower down the river, 2,000-pound mines being used. The lowest of these stations was at Deep Bottom a few miles above City Point. With a good many free negroes in the area, it was necessary to plant the mines and set up the firing apparatus by night to maintain secrecy. The battery was located in a pit near the river bank, the top being covered with twigs, and a lookout pit was prepared not far distant. This, also, was covered with brush.

The stations were scarcely established before United States troops under General Butler began moving from Bermuda Hundred toward Drewry's Bluff with a fleet of gunboats advancing up the river to cover their right flank. The Federals had learned from negroes that mines were planted in the vicinity of Deep Bottom, so parties of marines and seamen were landed on both sides of the river to locate the firing battery caches.

At the same time a flotilla of armed cutters and whaleboats began dragging the river for the wires. Their grapnels passed over and over the mine wires but somehow failed to engage them. The whole operation was watched by the lookout in the firing pit, who was often so near the passing boats that he could hear the orders given.

Finally the Federal commander decided that the reports of mines were false and ordered the gunboat *Commodore*

Jones, a converted double-ended ferryboat carrying 8 guns and a crew of some 200 men, to move up to Deep Bottom and send a landing party ashore to scout the vicinity. The gunboat advanced, passing over the mines, but the man at the wires kept his head and did not close the contact, for he hoped the Federals would move the former Confederate ironclad *Atlanta*, recently captured, up the river with more gunboats.

The *Commodore Jones* landed at the wharf at Deep Bottom and her landing party found that Confederates had recently occupied a couple of empty cabins. The gunboat hastily cast off to report and the man on watch decided to destroy her. When she passed over one of the mines he set it off, blowing the *Jones* to pieces. More than 60 of her crew were killed or drowned. The Federal Fleet promptly retreated farther down the river.

The detachments of marines and sailors ashore redoubled their searching and when a party of them approached the hidden battery position, the man on duty there ran from cover and was promptly shot. The small boats resumed dragging and finally hooked the wires. These were under-run to the shore, the lookout post was soon discovered, and two men found there were captured.

Thus was accomplished what is believed to be the first destruction of a warship by a submarine mine. The incident astonished the world and its immediate result was the rescue of Richmond from a second peril. General Butler, finding his army's right wing uncovered, retired to Bermuda Hundred.

The pressure being relieved along the James, the Torpedo Division was transferred to Wilmington, North Carolina, to lay mines at the mouth of the Cape Fear River, as it was believed a Federal blockading squadron was preparing to run past Forts Fisher and Caswell. The channel was only wide enough for two ships to pass at a time.

Seven 2,000-pound mines were planted in the regular channel near the bar. One wire from each mine connected it with a wire leading to one end of the battery, which was located in a bombproof of the fort. Another wire led from each mine to the opposite end of the battery and hung disconnected until the mine was to be exploded. All the wires were buried in the sand.

As before, the mine locations were betrayed to the Federals, this time by a deserting seaman, and Union warships made no effort to run the passage. Two mines planted above Fort Fisher toward Wilmington were set off when the wires were struck by lightning. These explosions increased the caution of the United States ships.

The increasing scarcity of materials in the Confederacy was an ever present handicap to the work of the Torpedo Division, and the construction of the batteries without glass tumblers to hold the acid and without platinum strips to immerse in the nitric acid required considerable ingenuity. There was no glass manufactured in the South and the only suitable platinum was being used in the batteries in telegraph offices.

The problem was solved by casting the zinc plates used in early experiments into cells shaped like ordinary glass tumblers, having a projecting arm for a handle as well as to connect it with the next adjoining cell in the series. The inside of the zinc tumblers was amalgamated with mercury, and a solution of sulphuric acid, composed of one part of acid and 13 parts of water, was poured into each tumbler or cell.

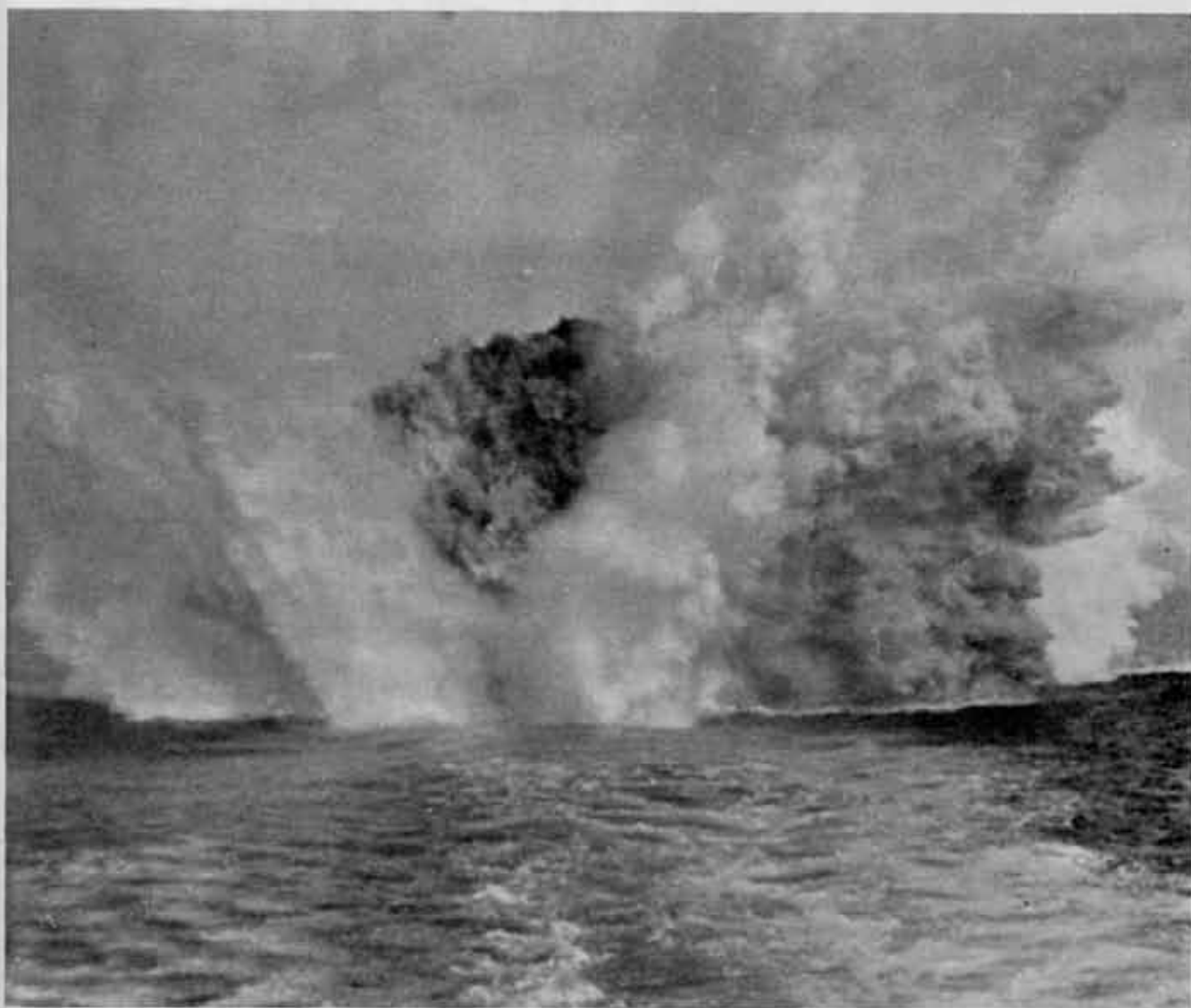
A cylindrical porous cup, open at the top and filled with nitric acid, was placed in the sulphuric acid solution. In the nitric acid was immersed a piece of cast iron having four projecting leaves and a projecting handle connected with a corresponding handle of the adjoining zinc cell by an ordinary brass clamp. It was found that the nitric acid did not consume the cast iron strip for several hours and when it did begin to effervesce, it was necessary to refill the porous cup with fresh nitric acid. The battery, as constructed, would stand rough usage and its electrical heating power was great, but its electromotive force was not sufficient to send current at a greater distance than 2 miles.

The operations of the Confederate Torpedo Division

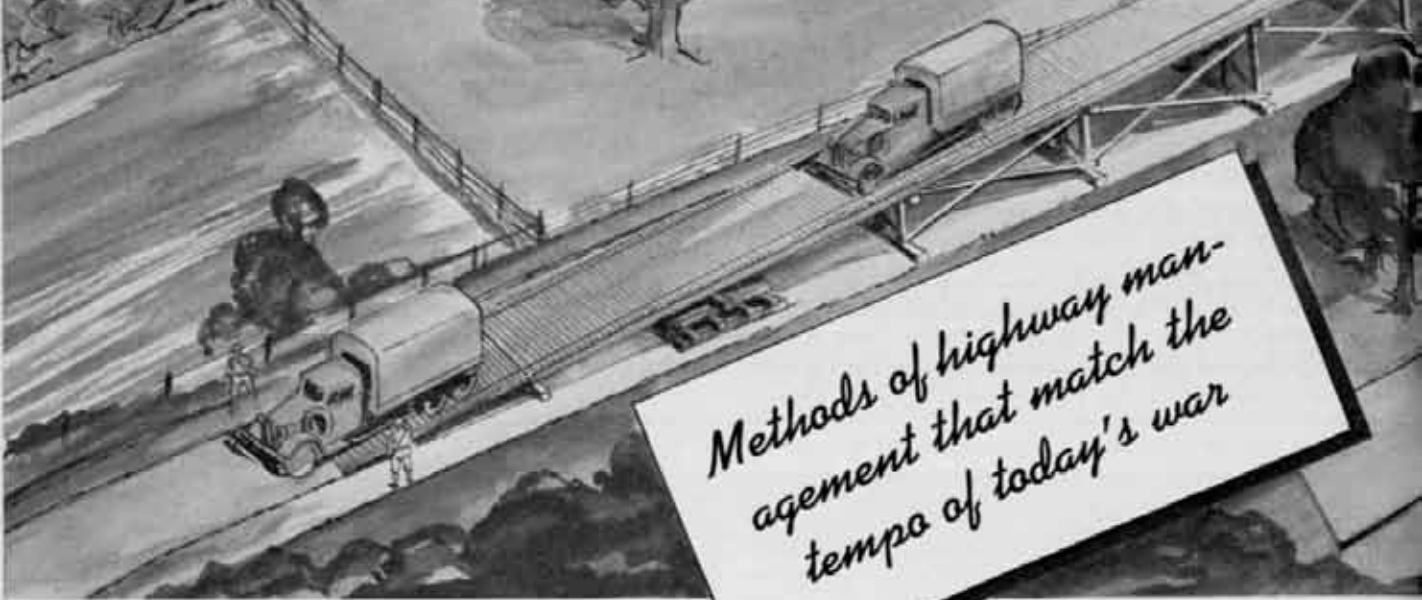
proper were now confined principally to the James and Cape Fear Rivers. The force was small, though sufficiently elastic to have extended to other points if needed materials had been available. It comprised the officer in charge, an electrician and his assistant, two men at each station, two or three telegraph operators, a couple of scouts and the crew of a tugboat commanded by an officer, some fifty men in all.

Of the two men at a station, one was usually a boatswain or master in the Navy and the other a man for relief work, who had either been wounded or otherwise incapacitated for active duty.

During the last year of the war, arrangements had been perfected to secure a large quantity of insulated wire, cables, acids, batteries, and telegraph apparatus from England. A little of this material was run through the blockade into Wilmington, but the bulk of the order was shipped in a fast steamer which encountered a storm and was wrecked while trying to make shelter in the port of Fayal. The entire cargo was lost and it was impossible to get a duplicate order delivered before the war ended.



TRANSPORTATION The Fifth "G"?



Methods of highway management that match the tempo of today's war



High-speed transportation is the essence of "lightning war." But high-speed transportation equipment, even when available in unlimited quantities, does not of itself insure rapid and uninterrupted movement. In fact, the very presence of large concentrations of transportation equipment may produce such congestion as to result in practical immobility.

Thus, recent events in Europe have indicated that the attainment of high-speed movement in warfare is not so much a question of possessing adequate transportation equipment as it is a problem of effectively managing this equipment. The Battle of France now appears to have been lost largely through traffic jams resulting from failure of the French system of transportation management.

Would our organization of transportation adequately meet the test of modern warfare? Or would congestion of transportation make us, too, an easy prey to enemy attack? Let us briefly examine our present system of transportation management and see how well it is adapted to stand the strain of lightning war.

We observe, first of all, that division of responsibility exists in our organization for transportation management. We find, for example, that the quartermaster corps is des-

ignated to handle military movements in the zone of the interior while the corps of engineers is responsible for the same kinds of movements when they occur in the communications and combat zones. We note, also, that within the general staff itself G-3 is made responsible for movements involving troops while G-4 is charged with movements involving supplies.

With respect to highway transportation we find responsibility still further divided. For here we see that route reconnaissance, route construction, route maintenance, and traffic planning are all functions of the corps of engineers, while the active management of traffic movements is left to the military police, an agency which is entirely apart from and beyond the supervision of the engineer authority responsible for the routes over which highway movements operate. We discover, moreover, that the vitally important function of highway management is now only a secondary function of both these agencies—and that no one considers it as a primary responsibility. Of course, it may be said that highway management is a function of command, and in this respect responsibility is not divided. Perhaps so, but the commanding general certainly can't be expected to manage



By CAPTAIN WARREN S. EVERETT, Corps of Engineers



highways himself. There must be a responsible agency to rely on—one to which the question of highway management is a continuing and definite endeavor.

Some weaknesses in our system of transportation management have been apparent even under peacetime conditions, where there has been a pronounced shortage of transportation equipment and where supply movements for the most part have been considered non-tactical. Time and again it has been pointed out at maneuver critiques that "something must be done" to remedy traffic congestion. But still no satisfactory answer has been given. And such an answer cannot be expected until a comprehensive study has been made of military transportation in its broadest aspects under modern conditions of warfare.

In the light of contemporary operations in the European War, however, the following conclusions with regard to military transportation seem warranted:

- (1) Scientific operation of highways is as important as the scientific operation of railroads has always been.
- (2) Improper or improvised management of highways may result in complete immobility and consequent military disaster.
- (3) Efficient utilization of highways permits a flexibil-

ity, invulnerability, and speed that cannot be matched by any other form of transportation.

If these conclusions are sound, it would appear that highway transportation is perhaps the most pressing of all military transportation problems. Yet it is obvious that highway transportation should be effectively coordinated with other forms of military transportation. With this in mind let us consider what specific steps might be taken to improve our system of transportation management.

The first and most essential step in this direction is to establish a sound organizational basis for transportation management. This, of course, should give full recognition to the increased importance of highway transportation in war. Division of responsibility for transportation, wherever it now occurs, should be remedied. Highway management in particular should be assigned to a single responsible agency; and this agency should be functionally qualified to handle it. Moreover, the agency charged with highway management should be provided with all necessary personnel and equipment; and such personnel and equipment should operate under the direct command and supervision of the management agency.

A satisfactory organization for transportation manage-



A traffic jam in the 3d Division area during the World War.

ment must obviously begin with the establishment of a single responsible authority at its head. From a broad national point of view this authority might well be vested in the chairman of a Transportation Committee operating as a part of the present National Defense Commission. Such a committee should include at least one representative each from the Army and the Navy in addition to qualified experts from each field of civilian transportation. The principal duty of the chairman of such a committee would be to coordinate all existing forms of transportation into a nation-wide network designed to operate harmoniously and effectively in any emergency. The highway transportation expert on this committee should assist in forming existing civilian traffic organizations into a national highway dispatching agency equipped to expedite mass highway movements in the same efficient way that the Association of American Railways now handles railway movements. Finally, essential transportation planning for the evacuation of threatened areas in the United States could be facilitated by utilizing the Transportation Committee to coordinate the detailed plans of appropriate civilian transportation agencies.

Division of responsibility for transportation management in the general staffs of all echelons of our military command could be eliminated by centralizing this function in a single general staff section. In view of the importance of transportation in modern military operations, perhaps the best possible solution in this regard would be to set up a fifth section of the general staff to assume responsibility for the coordination and control of all forms

of transportation used in warfare. A significant parallel for such a step is found in the new organization of the infantry battalion, in which there is provided on the battalion staff an additional staff officer charged with the management of all transportation assigned to the battalion.

With respect to an operating agency for highway management a decision is required as to whether this function should be given entirely to the engineers or to the military police. Inasmuch as the corps of engineers has, as one of its basic missions in warfare, responsibility for increasing the combat effectiveness of our own troops by facilitating movement, highway management would appear to be a proper engineer function. In line with this reasoning, the corps of engineers has been charged with responsibility for the construction, maintenance, and operation of railroads and inland waterways in the theater of operations. The engineers have also been responsible for road and bridge construction and maintenance, for route mapping and route marking, and for preparation of plans for traffic circulation and control. Certainly there is no logical reason for transferring these functions to the military police. Thus it follows that the corps of engineers should be made responsible for *all* phases of highway management, including the control of traffic over the routes it constructs and maintains.

For the sake of those who may object to removing the military police from traffic duties it is worthwhile looking into civilian experience with this same problem. Back in the twenties before the highway traffic problem became so complex as it is today, traffic control in civilian practice

was almost universally accepted as a police responsibility—just as it now is in the army. In recent years, however, almost every large community in the country has come to appreciate that traffic control is a technical, engineering job; and an entirely new field of engineering, traffic engineering, has been developed to deal with traffic problems. Even where traffic control responsibility has continued to be charged to police officials, the specialized nature of this work has been recognized to the extent that special traffic divisions, separate and apart from the ordinary police, have been organized to perform traffic duties.

If traffic control requires engineering talent in civil practice, it most certainly is an engineering job in war, where the enemy may be expected to employ every device at his command to complicate and disorganize our traffic movements. Moreover, in military practice we cannot possibly tolerate the idea that the military policeman needed for traffic direction might have to let traffic take care of itself while he goes off to break up a fight, set up a straggler line, or arrest a drunk. We must realize, too, that the enforcement approach to traffic control is ineffective in wartime, when a driver might prefer to be arrested rather than to proceed toward the front with his vehicle. What we need for military traffic are dispatchers trained in the technique of traffic movement—not policemen.

In arriving at a final answer to the problem of transportation management no approach should be neglected. The problem is so important that it deserves the consideration of the best civilian and military thought in the country. No promising ideas as to detailed organization, special equipment, or practical techniques to facilitate transportation management should be discarded until they have been tested and found unsatisfactory.

With regard to detailed organization for transportation

management, it is suggested that the increased emphasis on highway transportation be recognized in the corps of engineers by enlarging the present responsibility of the GHQ engineer to include highway management and by changing his title from "Director of Railways and Inland Waterways" to "Director of Transportation." In order to take care of his highway traffic control responsibility, the GHQ engineer should then be provided with a suitable traffic staff. In addition to this traffic staff the highway section of the GHQ engineer should include an information division to collect, consolidate, and disseminate road information; a division charged with road construction and maintenance; and a bridge division.

Under the communications zone engineer there should be a Manager of Military Highways to function on at least an equal footing with the Manager, Military Railway Service and the Manager of Inland Waterway Transportation. The staff of such a Manager of Military Highways should be organized along lines similar to those of the highway section under the GHQ engineer. As operating agencies under the traffic staff of the Manager of Military Highways there should be available one or more traffic battalions (each composed of a headquarters and service company and three or more sign-and-dispatcher companies), attached air corps units (to provide air transportation for traffic personnel), and attached signal corps units (to install and maintain communications and electrical equipment for traffic control).

Highway traffic in army could be handled by an army traffic battalion operating under the command of the army engineer. In the corps a traffic company under the corps engineer should be provided for traffic control work. In the division the division engineer should be able to manage this function, if he were provided with a traffic platoon.



During the World War it was often necessary for a column to come to a halt while the officer in charge asked for directions from an MP. Proper traffic control should obviate these delays.



During the recent operations in Belgium the wreckage of war strewn many a roadway to impede operations. The picture shows a German column threading its way forward through debris and refugees.

A suitable agency somewhere in the War Department should be designated to investigate and adopt for the use of the entire army useful techniques in driver selection and training developed recently in the military service or elsewhere. A rigid system of driver licensing should be prescribed by the War Department in order to weed out unfit or accident-prone drivers. In order to insure that drivers are never required to operate their vehicles during periods too long for safe driving, it is suggested that existing organizations be modified to provide an assistant driver for every vehicle. This assistant driver could in normal times perform other duties, but in an emergency would be on hand to relieve the regular driver before he became so fatigued as to endanger the safety of his vehicle.

Information as to accidents involving military vehicles should be collected and recorded with a view to facilitating the analysis of military accident data. Such information could be utilized in eliminating mechanical defects in vehicles, in correcting unsafe road conditions, in discovering dangerous driving practices, and in improving upon existing military traffic regulations.

The Adjutant General could materially assist in improving our organization for transportation management by setting up a personnel classification to provide selected officers and men specially qualified for service in this field. Existing civilian professional organizations would no doubt be glad to cooperate in supplying the qualifications of their members.

With regard to the development of equipment useful in transportation management, there is a whole field of useful military research yet unexplored. For example, a

simple, inexpensive compass might be developed for installation in military vehicles and thus provide one answer to the problem of keeping a driver from getting lost.

A system of radio traffic control now in use on the New York approaches to the George Washington Bridge may afford particular advantages for use in directing military rail as well as highway traffic. According to William S. Halstead, who developed the radio unit upon which this system is based, "the device will re-route cars to secondary thoroughfares from crowded highways, thus preventing jams before cars have a chance to pile up; change speed limits, speeding up or slowing down traffic in accordance with road conditions which may change from hour to hour; detour traffic in case of fire or accident; direct and re-route through traffic at bottleneck city entrances, bridge approaches and exits; and page doctors and others proceeding on certain routes." In its ultimate form Mr. Halstead expects that his system will make use of ultra-short wave short-distance radio. The small robot radio transmitting unit to be employed contains a magnetic steel tape recording unit which will make it possible to transmit any desired message to a moving motor column without danger of enemy interception. Messages can be telephoned to the small transmitters used. And once recorded on the steel tape these messages will be repeated until a new one is substituted or until erased by remote control over the connecting telephone line. A special military advantage of a radio control system of this kind is that it would make it possible for a traffic control post to operate under cover at a safe distance from fire directed at the road.

Automatic traffic counters have been in use in civil

practice for some time. It is possible that an inexpensive military adaptation of this device could be developed to assist traffic control units to dispatch traffic so that the density of movements would in no case exceed the capacity of route or terminal facilities to absorb traffic. In this way it would be possible to regulate traffic flow so as to eliminate for the most part the danger of traffic stoppages.

Inasmuch as the traffic capacity of a transportation intersection at grade is roughly only twenty-five per cent of the total capacity of the routes leading into it, every grade intersection is potentially a bottleneck for traffic movements. Civilian engineers have solved this problem by providing grade separations at intersections which carry heavy rail or highway traffic. It is even more essential that the military engineer have means at his disposal to provide grade separations at important intersections. For this reason there is a real need for the development of portable overpass equipment which could be transported to vital locations with the same facility as existing ponton bridge equipment. As a matter of fact, the military justification for overpass equipment is much the same as for river-crossing equipment. For in a military sense a heavy stream of traffic may be as much of an obstacle to cross-traffic as an unfordable stream of water.

Route mapping and route reconnaissance must be speeded-up to match the tempo of lightning war. To meet this need it might be possible to develop a special road reconnaissance car which could trace out automatically, and to scale, a graphical record of the route traversed and which could record mechanically such essential road information as time-distance between points, speed of travel, number of available traffic lanes, types and condition of surface, width of shoulders, etc. It is theoretically possible to make a scale map of the route traversed by utilizing a gyro-compass and an odometer to control the movement of a pen in relation to a rotating drum. Road information might be indicated with special symbols placed on the drum by a typewriter key mechanism operated by one member of the reconnaissance party. Time-distance between points could be indicated by a special clock which would automatically record time interval on the drum when actuated by an electrical or mechanical switch. Speed of travel over all roads traversed could be obtained by utilizing a suitable type of recording speedometer, such as the Sangamo Tachograph, which is now being used by commercial fleet operators to study the movements of their trucks.

With regard to techniques applicable to transportation management, we are able to apply with only minor changes the best civilian practices in railway and waterway transportation. Military highway transportation, however, presents problems which have no direct counterpart in civilian experience. For this reason there is indicated a vital need for special military tests, conducted on a rather elaborate scale, to provide basic factual data on which to build a scientific system of highway management. For example, we should lay out carefully planned experiments to test every possible expedient that may

facilitate movement at night without lights. Such experiments should include tests of various means to detect night blindness in drivers as well as a study of the physical and psychological factors involved in directing traffic during blackouts by using luminous signs. The redesign of driver's cabs on military vehicles should be studied with a view toward widening the driver's seat so that the driver can observe the path of his left front wheel on the road while driving at night without lights. An incidental advantage of such a redesign is the provision of a seat large enough to permit the driver to sleep comfortably in the cab during times when the situation may require him to stay with his vehicle for long periods without relief.

It is of immediate importance that we conduct vehicle headway tests under all possible conditions of operation in order to provide accurate information on which to base a revision of Leavenworth reference data on time lengths of columns. Such tests should be conducted with recruit drivers who have been selected and trained in accordance with the most enlightened system that the army can devise. In this way the information obtained will apply more accurately to the drivers we are soon to have than would be true if experienced military drivers were used.

It is not possible to investigate the problem of transportation management without being impressed by the tremendous possibilities inherent in a system of management which will take full advantage of the speed of modern transportation facilities. Our existing transportation organization did, of course, survive the "horse and buggy" era of our last active military experience. But this was possible only because of the excellence of our general staff system in effecting the necessary coördination and because operations moved so slowly that there was enough time for this coördination to be effected. It is even possible that our present organization may muddle through in a stabilized or static situation. But it is certainly not adapted to the dynamic characteristics of lightning warfare.

As a nation we have the capacity to excel any other country in the manufacture of high-speed transportation equipment. Our mastery in transportation is therefore not limited by the quantity of equipment which we can make available to support a national effort. It is seriously limited, however, by our ability to utilize this equipment without producing congestion. For this reason it is of vital importance that we take steps to place transportation management on a satisfactory organizational basis. Once this is done, research and development of techniques for controlling transportation will follow automatically.

Recent developments in warfare indicate that transportation management is now as important as the four existing command responsibilities. Moreover, nothing less than the coördination of all transportation under one head both in the zone of the interior and the theater of operations can guarantee uninterrupted movements in a serious emergency. These are fundamental principles on which must be based a system of transportation management that will provide a sure and satisfactory answer to the challenge of lightning war.

Radio Intercept and Interference*

By Major Rex Chandler, Field Artillery

The possibility of disastrous effects from hostile radio intercept and interference are receiving scant attention in this day of blitzkrieg and increasing dependence upon radio as a means of communication.

An analysis will show that a common sense attitude toward the use of radio and full knowledge of its characteristics will do much to alleviate the unfavorable conditions which exist in the use of military radio. The two primary characteristics are that present radio sets transmit in every direction, so that the transmissions may be picked up by hostile and friendly stations alike, and that language barriers offer little security in radio telephone or radio telegraph transmissions. There is a little assurance that any particular message emanates from a friendly station or a hostile one.

In 1939 the Field Artillery School conducted a series of tests to determine to what extent an enemy, using relatively low-power radio equipment, could intercept and interfere with our radio installation; the effects of such intercept and interference on field artillery communication and fire direction systems; and methods of combating intercept and interference.

Standard, unmodified issue radio sets were used. The intercept and interference stations were located as nearly as possible to conform to the tactical situation. They were located at least 1,500 yards within the hostile front lines except when firing restrictions interfered, in which case they were placed on the flank at least 2,000 yards from the nearest radio set used in the problem.

With an SCR-178 net, an interference station used a steady tone signal on the same frequency as the air or ground station transmission. Although voice signals were used by the friendly stations, frequent repeats were necessary and not one mission was completed while the interference was on the air.

With an SCR-194 net, the intercept station sent several erroneous messages which were accepted. The intercept station was able to get information from friendly operators concerning their own location and the location of other units. Sets with firing batteries were closed out by the intercept station and ordered to report to the battalion command post. One operator complied—others were off the air for short periods, evidently while checking with the command post by telephone. The operators attempted to identify each other by the use of nicknames, which delayed transmissions. Fire missions were interfered with by giving erroneous sensings, some of which were believed acted upon.

During this test operators gave valuable information to intercept stations when asked. Air-ground communication failed because of lack of training of operators in working through interference. It was apparent to all concerned that

it is impossible to rely on recognition of voices to insure identification of the sending station.

In another exercise, the interference station saw a plane in the air and checked into the net. The interference operator gave a target using the coordinates of a hilltop upon which he had observed a number of men and horses, and was able to fire a complete adjustment (simulated) and ask for fire for effect. When the plane did report a target to the battalion, the interference operator delayed the mission for twenty minutes; using tone and voice transmissions.

In a brigade exercise, the intercept station used the call letters of the net control (brigade) station, which were learned when the net control station announced itself as such, giving its call letters. As each station reported into the net, the intercept station shifted each station off frequency as much as 100 kilocycles by informing it that its frequency was off. The intercept station was in control of the net most of the time.

While the stations were off frequency and the control station was trying to get them back on, an airplane reported into the net. The control station told the observer to work with one station, but that station was so far off frequency that it never received the control station's message. After calling the designated station's frequency for twenty minutes, the observer returned to the net, but the interference station prevented him from explaining the situation to the control station. The plane went home without having accomplished its mission.

The intercept station was able in many instances to receive a message, receipt for it, and leave the sending unit operating under the assumption that the message had been received by the proper headquarters. This caused many delays in movement of units and in designation of targets.

In another exercise two SCR-178 sets were used to create interference, one set by broadcasting tone over a twenty kilocycle spread by varying the transmitter dial rapidly while transmitting, the other by broadcasting code signals simultaneously. This interference was put on in a succession of two-minute periods with short pauses between. It took one net station thirty minutes to send a ten word message to another station in the net. During that same afternoon, an interference station used the call letters of an observing plane and succeeded in causing a battalion to adjust on a target assigned by the interference station, using five rounds of ammunition. The observer tried to stop the adjustment but no attention was paid to him. The interference had been in control of the air-ground net for about thirty minutes.

The amount of information given to hostile radio intercept stations is a matter of training and discipline of our own operators. It is believed that information given to hostile intercept stations can be minimized by strict in-

*Condensed from an article in the September-October *Field Artillery Journal*.

sistence upon radio discipline among operators and by each officer exercising care in the type of tactical messages he authorizes to be transmitted in clear text by radio.

It is entirely possible for an enemy, using radio equipment similar to our own sets, and using no more power to delay, disrupt, confuse, and even prevent the use of our present radio communication. This can be done by the use of varying-tone transmissions, or by reading any text during the transmissions of the unit being interfered with. Deceptive messages, in which the interference operators impersonate friendly observers, succeeded far beyond the expectations of the interfering stations.

When a few deceptive messages indicated to friendly personnel that something was amiss, the delay incident to checking stations and doubt of the authenticity of all messages was quite serious.

Strict observance of the following simple rules appears to be the best method of minimizing the effects of hostile radio interference and intercept:

(1) Nets should be organized with as few stations as possible. Two-station nets are best.

(2) The use of call signs and the conventional call-up should be restricted.

(3) An identification code should be used, one group to be used preceding each transmission.

(4) The identification code should be used at all times regardless of whether an enemy may be listening or not.

(5) Any message from a station which cannot be identified by the identification code in use at the time should be refused.

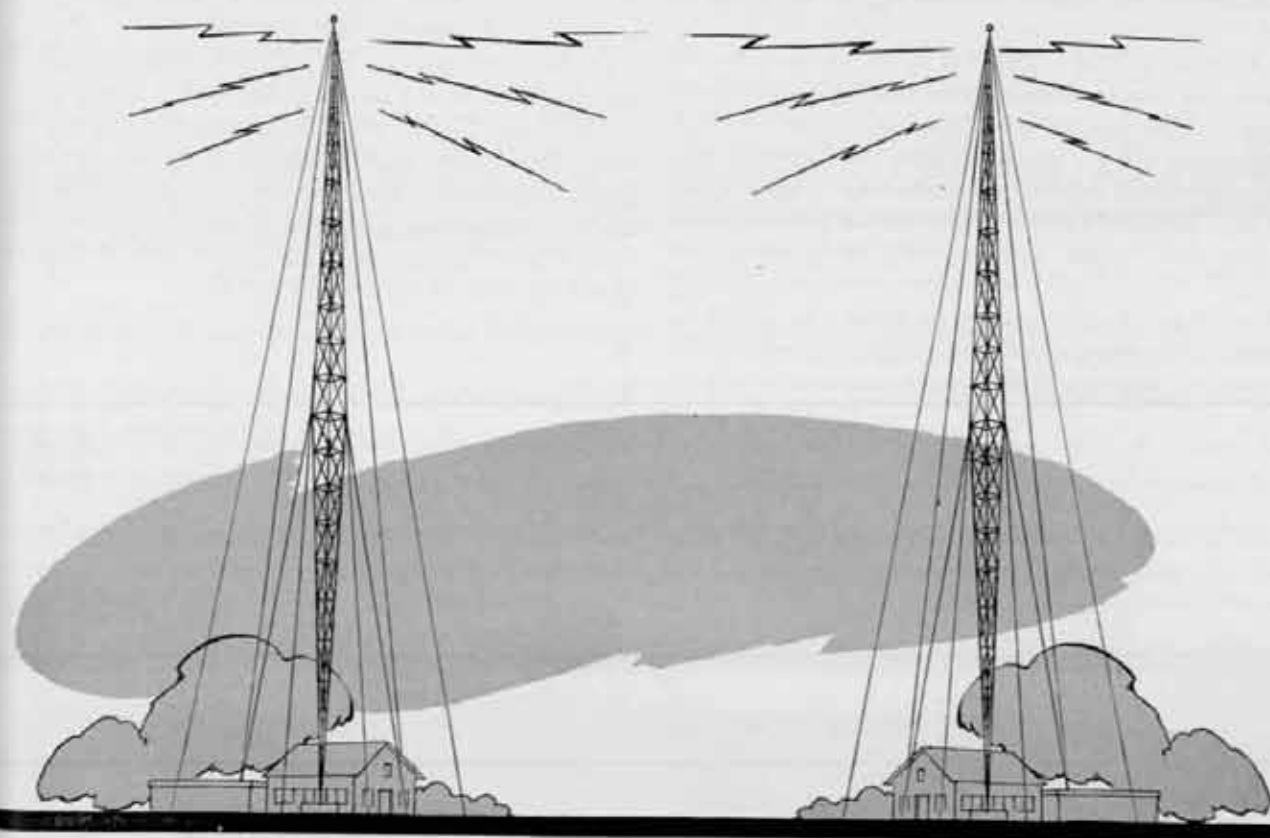
(6) Inter net communications always should be prearranged and an identification code provided for the purpose.

(7) In making up the code, each group should be numbered, the sequence of the groups should not be repeated, and a system of cipher should not be employed. An arbitrary list of code groups of sufficient length for the period of time during which it will be used will be most satisfactory. After it has been used once it should be destroyed.

(8) Procedure signs and signals which have to do with the movement of a station, the time it will report out of a net, and the like, should be eliminated.

(9) Short, quick transmissions should be employed.

(10) *Above all, operators should be trained to work through interference of all kinds.*



UNIVERSAL SET-FORWARD RULE

By Lieutenant Colonel Leon C. Dennis, Coast Artillery Corps

We are all aware of the fact that in firing seacoast armament, we must think in terms of high speed and maneuvering targets and NOT in terms of targets towed "Down a groove" at ten knots. Our regulations now prescribe that the observing interval be 20 seconds or less. This speeding up of the plotting section facilitates the tracking of maneuvering targets; a corresponding improvement in the functioning of our standard predicting devices appears to be desirable.

A brief survey of our present "standard" set-forward devices discloses the following:

a. **Set-forward Rule.** The maximum target speed provided for is only 20 knots. The range from the plotting board must be converted to time of flight and remembered by the operator until after the travel is announced by the plotter. The dead time is one minute, and the plotter must measure back along the course three or four observing intervals. As a result of these deficiencies the rule is seldom used.

b. **Set-forward Charts.** Those now issued provide for target speeds up to 12 knots. To provide for all target speeds and times of flight, our charts would have to be about five feet wide by six feet long. Also, a new chart is necessary for any change in observing interval and dead time.

c. **Set-forward Scales.** Different scales are necessary for each combination of observing interval and dead time and a series of scales must be constructed to take care of every possible time of flight of the battery. For a 16-inch gun battery this would require, for two-second changes, about 60 scales. The claim is made that the use of scales saves one man and reduces noise in the plotting room. For TARGET PRACTICE these scales are very convenient but for BATTLE it is believed an extra man would be kept busy changing scales for the plotter, especially on an incoming or outgoing course. Also, mistakes would be likely.

For reasons set forth above, the writer designed a rule which operates like a slide rule for the solution of the

set-forward equation. This rule is universal in that it provides for slow and high speed targets, any reasonable combinations of observing interval and dead time, and can be used for any gun from subcaliber to 16-inch.

The rule is illustrated in Figure 1. The working drawings for construction of a rule of this type, and the necessary charts and scales are shown in Figure 2.

For the basic theory of the set-forward rule, see Section II, Chapter 9, FM 4-15. The basic formula

$$Y = \frac{X}{M} (t + D) \text{ may be multiplied by } \frac{D}{D} \text{ to obtain}$$

$$Y = X \frac{D}{M} \frac{(t + D)}{D}, \text{ or expressed in logarithms, this equation becomes:}$$

$$\log Y = \log X + \log \frac{D}{M} + \log \frac{(t + D)}{D}$$

in which Y = travel of the target during $t + D$

X = travel of the target during M

M = the measuring interval equal to, or some multiple of, the observing interval

D = (dead time) the time in seconds from the instant of observation to the instant of firing with data computed from this observation. (See Par. 10, FM 4-15)

t = time of flight in seconds

In this form we can multiply by adding graphically the logarithms of the factors involved. See Figure 3.

The X and Y scales are ordinary logarithmic scales constructed so that one logarithmic unit is equal to 10 inches. This makes the rule about 26 inches in length. The scale could be made twice as long by using one log unit equal to 20 inches. This would make a more accurate rule but would be more cumbersome to handle.

The $\frac{t + D}{D}$ chart is the most difficult to construct. A computation of $\log \frac{(t + D)}{D}$ should be made for each whole second time of flight and for each value of D . However, in the chart shown and furnished, computations

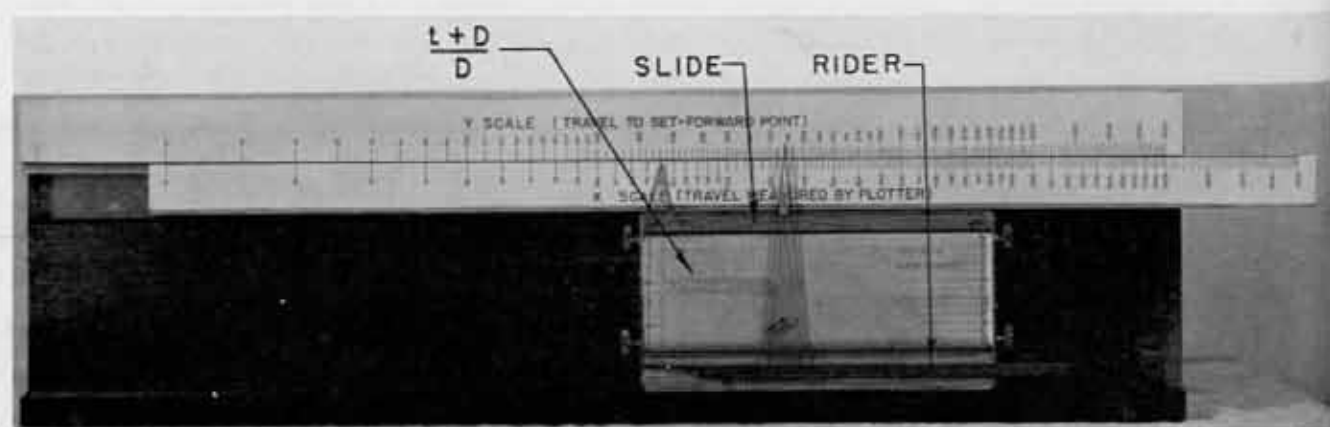


Figure 1

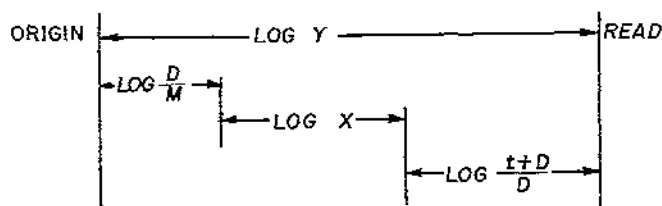


Figure 3

in by the battery for its particular armament. To fill in the ranges, extract from the firing table the ranges to the nearest 100 yards that correspond to the times of flight to the nearest whole second. Note that times of flight curves are shown for every second to and including 40 seconds and for every two seconds from 40 to 130 seconds.

If but one dead time is selected by the battery commander, a scale for that dead time can be constructed instead of a chart. However the chart has the advantage in that training may be progressive and variations of the TI bells from normal can be corrected for. For example, in a 20-second system, if the actual timing of the bells discloses them to be 19 seconds instead of 20 seconds, and a dead time of twice the observing interval is being used, the $\frac{t+D}{D}$ chart can be rolled to 38 instead of 40.

The X scale can be moved along the Y scale to take care of the different ratios of M to D. This setting of M to D provides for the $\frac{D}{M}$ factor. See Figure 3.

For example, assume that the observing interval to be used is 20 seconds, that one observing interval is used as M, and that the dead time to be used is 40 seconds. Set 20 on the X scale under 40 on the Y scale and clamp the X scale. If it is desired to use two observing intervals for the purpose of obtaining smoother readings of the travel then $M=40$ instead of 20. Set 40 on the X scale under 40 on the Y scale. Similarly, if $M=m$ seconds and $D=d$ seconds set m on the X scale under d on the Y scale.

Operation.

- a. Set the values of M and D as explained above. Clamp the X scale in this position.

- b. Turn the rollers bearing the $\frac{t+D}{D}$ charts until the proper combination of projectile and powder charge chart is under the window and the range setting arrow is on line with the *dead time selected* above. Numbers on both the right and left sides of each chart indicate values of D from 30 to 60 and assist in aligning the chart. (*Caution:* Be sure the zero time of flight line (left hand line) is exactly under the SET pointer index.) Fasten the chart in this position. The board is now ready for operation.

- c. When the operator of the rule hears the plotter announce the range to the last set-forward point, the operator moves the rider on the slide until the arrow marked RANGE is at the range curve indicated on the chart. There is plenty of time for this operation.

- d. As soon as the plotter calls the travel of the target as measured by his prediction scale, the operator sets this travel on the X scale by moving the SET pointer to that number and immediately calls back to the plotter the reading indicated by the READ pointer on the Y scale.

- e. A refinement in obtaining the value of $\frac{t+D}{D}$ can

be made for high speed incoming or outgoing targets where large range changes are encountered. It will be noted that during the operation of the rule, ranges to the *last* set-forward point are used. During a 20-second observing interval a target traveling at 45 knots can cause a change in range of about 500 yards, which, converted into terms of time of flight, might be as much as two or three seconds. To correct for this error the operator should note the amount of change in range in terms of *spaces* between the time of flight (range) curves. He should then predict the range to the *next* set-forward point by moving the RANGE pointer that much more in the same direction. If the prediction is correct the next set-forward point called by the plotter should coincide with that already set, in which case the operator moves the RANGE pointer to his next predicted set-forward point by moving it the number of spaces as before, etc.

To check the rule mathematically assume several sets of data and apply the formula $Y = \frac{X}{M} (t + D)$. Examples:

- a. $D=40$, $M=20$, $t=38$, $X=140$

$$Y = \frac{140}{20} (38 + 40) = 550 \text{ (nearest 10)}$$

On the rule set 20 on X scale under 40 on Y scale; move roller until RANGE arrow is on 40 of chart; move RANGE pointer to 38 second time of flight curve; move SET pointer to 140; read 550 at READ pointer.

- b. $D=38$, $M=38$ (two observing intervals of 19 each), $t=60$, $X=450$

$$Y = \frac{450}{38} (60 + 38) = 1160$$

Set 38 on X scale under 38 on Y scale; move roller to $D=38$; move range pointer to $t=60$; move SET pointer to 450; read 1160 at READ pointer.

It will be noted that in dealing with values of X and Y the term yard has not been used. The rule is actually built in terms of yards but the figures on the X and Y scales may be any units. It is immaterial as to what units are used in the construction of the prediction scale shown in Figure 30, FM 4-15. The plotter reads a certain number (of graduations) representing the travel of the target during M, this number is multiplied by the rule, and a number (of graduations) is called back to the plotter.

Pending further study and official action in connection with the standardization of the Dennis set-forward rule.

drawings and charts (Figure 2) may be obtained on request from the Coast Artillery Board, Fort Monroe, Virginia.

APPENDIX

The following is appended for those who desire to build a complete rule:

The X and Y scales (Origin = 10)

Tabulate all data:

(1) Units travel during M	(2) Log of (1)	(3) Factor*	(4) Scale (inches)	(5) Scale from origin (inches)
10	1.0000	x10	10.000	0.00
20	1.3010		13.01	3.01
30	1.4771		14.77	4.77
40	1.6021		16.02	6.02
50	1.6990		16.99	6.99
60	1.7782		17.78	7.78
70	1.8451		18.45	8.45
80	1.9031		19.03	9.03
90	1.9542		19.54	9.54
100	2.0000		20.00	10.00
110	2.0414		20.41	10.41
etc.		etc.		etc.

*In this case 10 because the scale is 1 log unit = 10 inches.

For 1 log unit = 20 inches the factor would be 20, etc. Using the data contained in column (5) plot the

points along a straight line and number them with the corresponding figures in column (1). See Fig. 2.

The $\frac{t+D}{D}$ chart (Origin = 0)

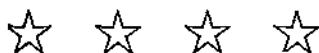
Tabulate all data:

For D = 30 seconds**

(1) t	(2) $\frac{t+D}{D}$	(3) log (2)	(4) Factor	(5) Scale (inches)
0	1.000	.0000	x10	0.00
1	1.033	.0141		0.14
2	1.067	.0282		0.28
3	1.100	.0414		0.41
4	1.133	.0542		0.54
5	1.167	.0671		0.67
6	1.200	.0782		0.79
etc.		etc.		

**Similar data for values of D of 40, 50, and 60 seconds must be tabulated.

To construct the chart, decide upon a vertical scale (ordinates) for the values of D. (In this chart 1 inch was made equal to 10 seconds.) Plot along the 30 second line the data contained in column (5) above and mark these points, temporarily, in seconds of time of flight. Proceed in the same manner for the 40-second line, 50-second line, and 60-second line. Connect all points of equal times of flight with smooth curves. From the firing table, insert on these curves the ranges (to the nearest 100 yards) corresponding to the times of flight plotted.



As long as there are battleships, the big-gun, fixed battery will remain the most certain and least expensive method of defending our harbors against sea attack.

GENERAL C. E. KILBOURNE.

BOFORS 40-MM. MATÉRIEL*

AA GUN

The Bofors 40-mm. AA gun which is in use by the British and has seen service in Poland, Finland and Norway consists of a solid tube joined on to a breech part by means of a bayonet closure to permit rapid exchange. The barrel may be either air- or water-cooled. The breech mechanism is of the vertical wedge type. There is a magazine holding eight rounds which is fed by means of cartridge frames, each holding four cartridges. When the rounds are inserted into the magazine the frames are shed sideways. The gun may be loaded from any angle.

The firing device is actuated by a foot pedal and can be set for automatic fire as well as for firing single rounds. When a shot is fired the cartridge case is ejected to the rear where it strikes a deflector which deflects it toward the front. Recoil is taken up by means of a hydraulic brake; recuperation is by spring.

There are several types of carriage of which only two will be mentioned. The field carriage mounts a single gun and is of a lowerable, cross bed, four wheel type. It is stated that an experienced crew can put this gun in or out of action in 30 seconds. If the ground is soft, steel pins about three feet long may be driven into the ground through slots on the side of each of the four frame members. If this is done 30 seconds more are required for going into action.

The elevating and traversing mechanism of this gun is hand operated by members of the crew who sit on either side of the gun. Stabilization across the trunnions is done by a member of the crew who sits in front of the mount and levels on the horizon through a reflector sight or by watching a small spirit level.

A built-in corrector, operated by one or two men, is mounted on the right hand side of the gun. The speed and course of the target and the range must be set on this corrector by hand. The corrector automatically transfers this data to the sights by means of cams, gear and rods. The men operating the elevating and traversing mechanisms merely look through a sight about three inches square and track the target.

Large numbers of this gun have been sold to private industrial plants and to cities and towns in Sweden. These purchases have come about as a result of the experiences of Finnish towns during the Russo-Finnish war. It seemed to be standard practice of the Russians to drop incendiary bombs and later return to machine gun any fire-fighting apparatus which was attempting to put out the fire. In Sweden, towns and large private industries have purchased their own antiaircraft guns and have volunteer crews to operate them.

A twin-mount with gyroscopic stabilization is manufactured for naval use. This model is stabilized for roll

and pitch and in addition has a third stabilizer to prevent the gun from moving off the target when the ship changes course.

Weight of the projectile is one kilogram, and of the cartridge 2.1 kilograms. The muzzle velocity is 850 meters per second. Maximum range 11,200 meters. Rate of automatic fire 120 rounds per minute.

AA AMMUNITION

On June 4, 1940, a firing test was held on the Bofors proving grounds using the 40-mm. field gun.

The gun was fired at 300 meters against a target consisting of two strips of aeroplane fabric four inches apart; one meter behind this a sheet metal plate approximately two meters square. These targets were examined after the firing and in each case it was found that the front piece had a clean hole, and that the rear piece had a hole about six or eight inches in diameter. This showed that the shell had a practically instantaneous burst. On the sheet metal plate the pattern made by the fragments was about four feet in diameter and almost perfectly round. The holes were very evenly distributed and a count showed between 100 and 200 in each plate, except in one case where there were only about fifty holes. The proving ground personnel stated that all rounds fired were rejects from a contract for the Swedish Army; that these were being used because present conditions prohibited the use of new ammunition for demonstrations.

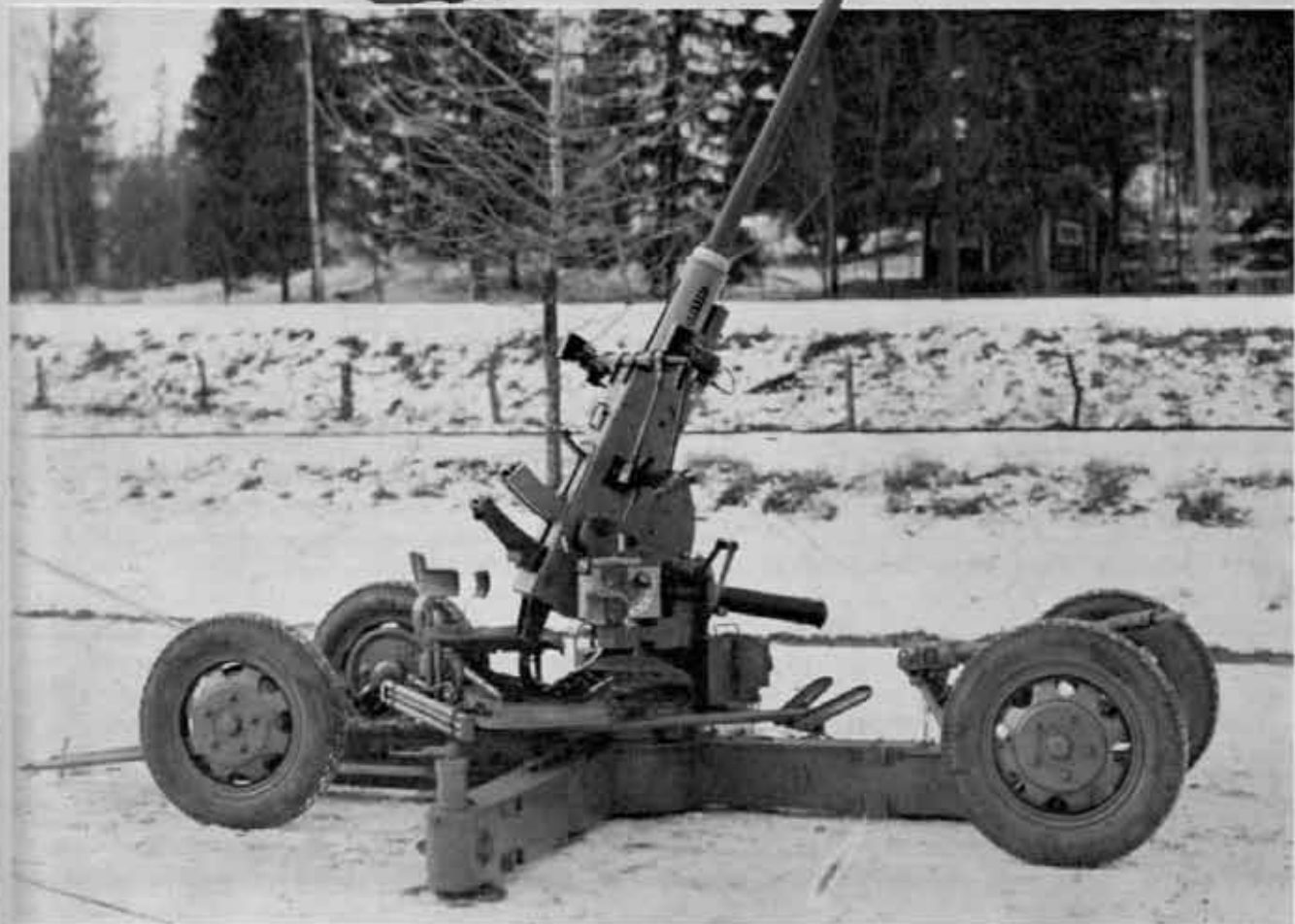
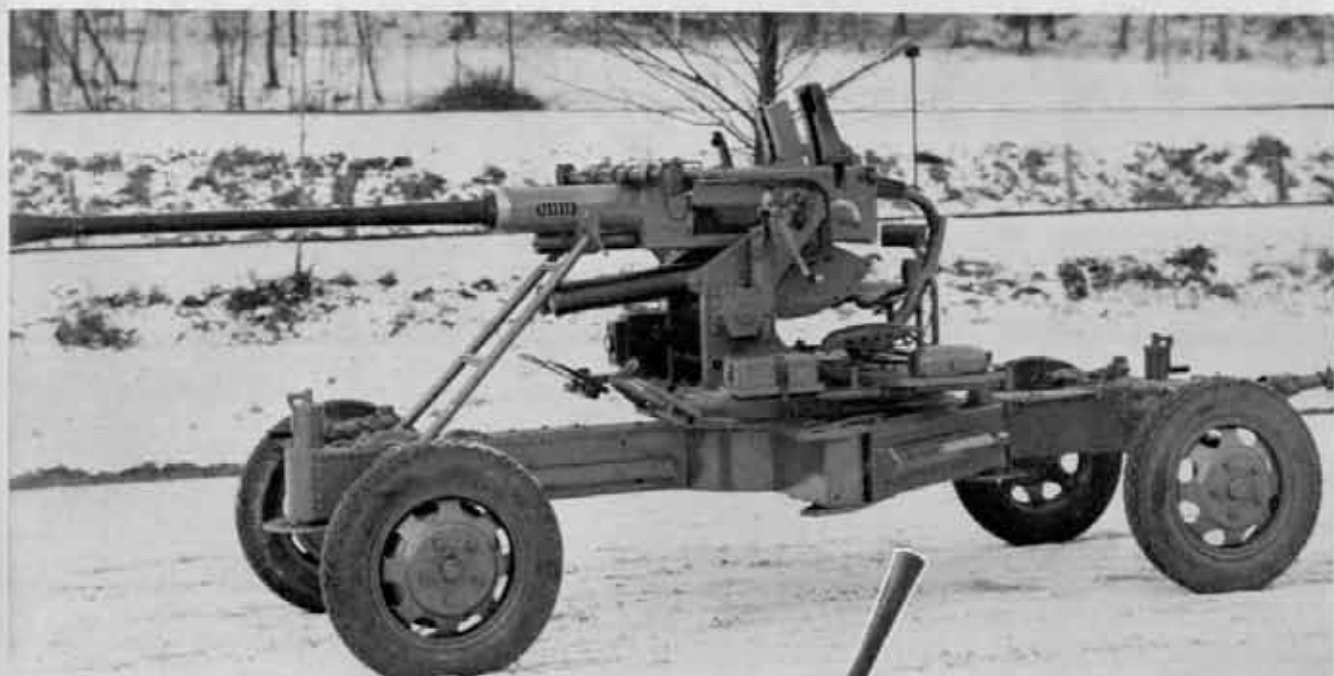
Also at 300 meters the gun was fired against a target consisting of two pieces of wrapping paper placed four inches apart. Two thicknesses of aeroplane fabric were placed eight inches in front of the gun muzzle. Five rounds were fired and in each case the projectile made a clean hole in the aeroplane fabric and thus proved that the fuse was not armed upon leaving the gun. Each time the rearmost paper target was blown to bits. During this test the gun crew remained on their seats and appeared to have no concern over a possible burst near the muzzle. The officials stated that if the projectile should burst upon striking the aeroplane fabric or even in the gun itself, the velocity was such that all fragments would fly forward.

Another test which Bofors makes to prove the instantaneous action of the fuze, but which was not done at this firing, is also interesting.

A sheet metal disk about four feet in diameter is revolved so that the perimeter is traveling at about 2,000 meters per minute. A projectile is fired against the flat side to strike the disk as near the perimeter as possible. Of several such disks examined, the hole was about four inches in diameter, and only slightly wider along the circumference than along the diameter of the disk.

A second fuze action is obtained by allowing the tracer component of the charge to burn through to the base of the regular fuze to explode the shell in the air if the target

* (Compiled from various sources.)



is missed. Ammunition manufactured for the British before the war burned 7.5 seconds before exploding, while all Swedish ammunition now being manufactured explodes at the end of 11.5 seconds.

General data:

Muzzle velocity 850 meters per second

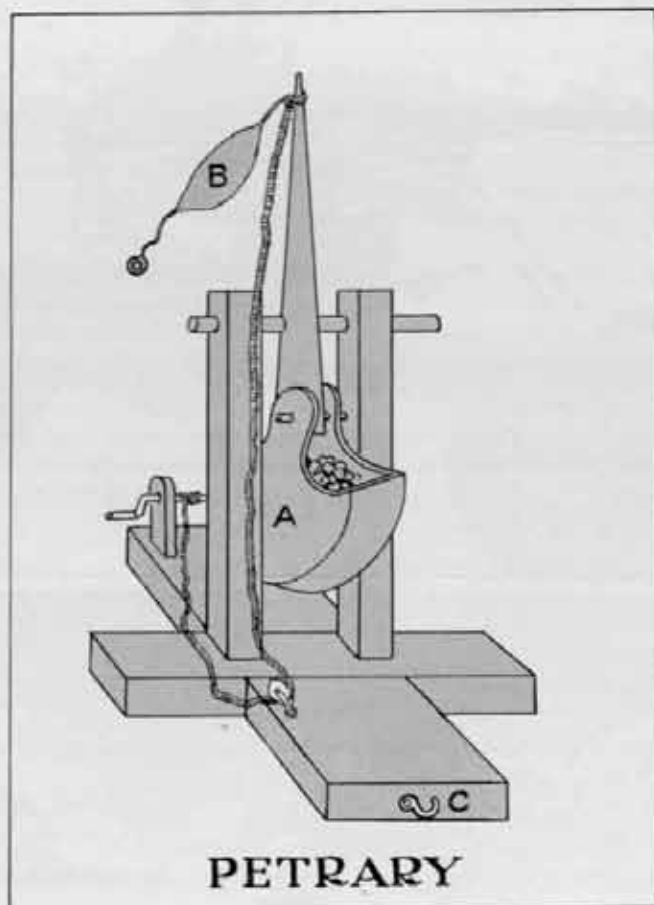
Maximum vertical range
for 11.5 seconds 4,930 meters

Maximum horizontal range
for 11.5 seconds 4,950 meters

Maximum horizontal range 11,200 meters

Weight of projectile 1.0 kilogram

The Story of Artillery Through the Ages



Chapter 11: THE PETRARY

By W. A. WINDAS

After the smash-up of the Roman Empire, art and science declined. The once mighty empire disintegrated into small states without cultural background; each at war with the other. The vast public works that Rome had spread over the face of Europe fell into neglect. Europe entered the Dark Ages.

Each chieftain built a fortress or castle, using Roman forts as models or used the forts themselves if they were still serviceable. The populace grouped around the castles, retired into them if attacked, and could be dislodged only by the long, slow process of siege and starvation. The attackers lacked siege engines to break down the stone walls. However, in time attempts were made to devise some means of reducing the castles; various war-engines appeared.

The fine tension and torsion ballistae of Greece and Rome were forgotten. The machines developed were relatively simple affairs. Many were tried; most were in-

effective. An attempt was made to use wind for power, but the results were far from satisfactory.

The type most universally adopted used the counterweight principle, and appeared under many names—mangonel, bricole, perrier were a few of the designations of this type of engine.

The petrary shown was a stone-thrower. The counterweight (A) was attached to the short end of the lever; the stone, to the long end. The long end of the lever, with the sling (B) was pulled down, raising the weight. When the stone was placed in the sling, and the trigger (C) released, the weight would fall, causing the sling end of the pole to fly up and forward. Since the sling was at the long end of the lever, it would move upward at higher speed than the weight moved down. One end of the sling was fastened loosely, so that it would come off the arm as the latter finished its arc, hurling the stone by centrifugal force.

At its best, the petrary could throw a stone about the size of a man's head approximately 200 yards or less.

Outline of Coast Artillery Training Literature

FIELD MANUALS

- *FM 4-5 CAFM Seacoast Artillery—Organization and Tactics. (Restricted.)
- *FM 4-10 CAFM Seacoast Artillery—Gunnery (formerly TM 2160-30).
- *FM 4-15 CAFM Seacoast Artillery—Fire Control and Position Finding (formerly S.T. No. 32).
- *FM 4-20 CAFM Seacoast Artillery—Formations, Inspections, Service and Care of Matériel.
- *FM 4-25 CAFM Seacoast Artillery—Service of the Piece, 155-mm. guns (formerly TR 435-184).
- *FM 4-35 CAFM Seacoast Artillery—Service of the Piece, 14-inch gun, M1920 MII on Railway Mount M-1920 (formerly TR 435-227).
- *FM 4-40 CAFM Seacoast Artillery—Service of the Piece, 12-inch Mortar, Railway Artillery (formerly TR 435-230).
- *FM 4-45 CAFM Seacoast Artillery—Service of the Piece, 12-inch gun Railway Mount M1918 Railway Artillery (formerly TR 435-234).
- *FM 4-50 CAFM Seacoast Artillery—Service of the Piece, 8-inch gun, Railway Artillery (formerly TR 435-235).
- *FM 4-55 CAFM Seacoast Artillery—Service of the Piece, 12-inch Mortars (Fixed Armament) (formerly TR 435-255).
- *FM 4-60 CAFM Seacoast Artillery—Service of the Piece, 12-inch guns (Barbette Carriage) (formerly TR 435-260).
- *FM 4-65 CAFM Seacoast Artillery—Service of the Piece, 10-inch guns (Disappearing Carriage) (formerly TR 435-265).
- *FM 4-70 CAFM Seacoast Artillery—Service of the Piece, 6-inch guns (Disappearing Carriage) (formerly TR 435-266).
- *FM 4-75 CAFM Seacoast Artillery—Service of the Piece, 6-inch guns (Barbette Carriage) (formerly TR 435-267).
- *FM 4-80 CAFM Seacoast Artillery—Service of the Piece, 12- and 14-inch guns (Disappearing Carriage) (formerly TR 435-270).
- *FM 4-85 CAFM Seacoast Artillery—Service of the Piece, 16-inch guns and Howitzer (formerly TR 435-275).
- *FM 4-90 CAFM Seacoast Artillery—Service of the Piece, 3-inch Rapid Fire Guns (Barbette Carriage) (formerly TR 435-276).
- *FM 4-105 CAFM Antiaircraft Artillery—Organization and Tactics.
- *FM 4-110 CAFM Antiaircraft Artillery—Gunnery, Fire Control and Position Finding Antiaircraft Guns. (Restricted.)
- *FM 4-111 CAFM Antiaircraft Artillery—Position Finding and Control, AA Searchlights.
- *FM 4-112 CAFM Antiaircraft Artillery—Gunnery, Fire Control and Position Finding Antiaircraft Automatic Weapons.
- *FM 4-115 CAFM Antiaircraft Artillery—Operation of Material and employment of personnel, antiaircraft—searchlight units.
- *FM 4-120 CAFM Antiaircraft Artillery—Formations, Inspections, Service and Care of Matériel.
- *FM 4-125 CAFM Antiaircraft Artillery—Service of the Piece, 3-inch Antiaircraft Guns (formerly TR 435-205).
- *FM 4-130 CAFM Antiaircraft Artillery—Service of the Piece, 105-mm. Antiaircraft Guns.
- *FM 4-135 CAFM Antiaircraft Artillery—Marksmanship and Service of the Piece, Antiaircraft Machine Gun.
- *FM 4-140 CAFM Antiaircraft Artillery—Service of the Piece, 37-mm. Antiaircraft Guns.
- *FM 4-150 CAFM Examination for Gunners (formerly TR 435-310).
- *FM 4-155 CAFM Reference Data (Seacoast and Antiaircraft Artillery).
- FM 4-160 CAFM Coast Artillery Training.

TECHNICAL MANUALS

- *TM 4-205 Coast Artillery Ammunition.
- *TM 4-210 Coast Artillery Weapons and Matériel (Restricted).
- TM 4-215 Repair and Test of Submarine Mine Cable. (Now published as TR 1160-15.)
- TM 4-225 Coast Artillery Orientation. (Now published as TM 2160-25.)
- TM 4-235 Coast Artillery Target Practice. (Now published as TM 2160-35.)
- TM 4-240 Meteorology for Coast Artillery.

- TM 4-245 Preservation and Care of S.C. Defense Matériel. (Now published as TR 1160-20.)
- *TM 4-250 Stereoscopic Range and Height Finding. (Restricted.)
- *TM 5-236 Surveying Tables. (Prepared under direction of the Chief of Engineers for joint use by Coast Artillery, Field Artillery and Engineers; includes content of Consolidated Tables, The Coast Artillery School and many other useful tables.)

*Printed.

COAST ARTILLERY TABLES OF ORGANIZATION

- T/O 4-10-1 Headquarters and Headquarters Battery, Brigade.
- 4-10 Brigade, Antiaircraft, Mobile.
- 4-11 Regiment, Antiaircraft, Mobile.
- 4-11 Medical Detachment, Regiment, Antiaircraft, Mobile.
- 4-12 Headquarters and Headquarters Battery, Regiment, AA, Mobile.
- 4-15 Battalion, Gun, Antiaircraft, Mobile.
- 4-16 Headquarters and Headquarters Battery and Ammunition Train, Battalion, Gun, Antiaircraft, Mobile.
- 4-17 Battery, Gun Antiaircraft.
- 4-18 Battery, Searchlight, Antiaircraft.
- 4-25 Battalion, Automatic Weapons, Antiaircraft, Mobile.
- 4-26 Headquarters and Headquarters Battery and Ammunition Train, Battalion, Automatic Weapons, Antiaircraft, Mobile.
- 4-27 Battery, Machine-Gun, Antiaircraft, Mobile.
- 4-28 Battery, 37-mm. Gun, Antiaircraft.
- 4-30 Brigade, 155-mm. Gun.
- 4-31 Medical Detachment, Regiment, 155-mm. Gun, Tractor Drawn.
- 4-31 Regiment, 155-mm. Gun, Tractor Drawn.
- 4-32 Headquarters and Headquarters Battery, Regiment, 155-mm. Gun, Tractor Drawn.
- 4-35 Battalion, 155-mm. Gun, Tractor Drawn.
- 4-36 Headquarters and Headquarters Battery and Ammunition Train, Battalion, 155-mm. Gun, Tractor Drawn.
- 4-37 Battery, 155-mm. Gun, Tractor Drawn.
- 4-38 Battery, Searchlight, Regiment, 155-mm. Gun, Tractor Drawn.
- 4-41 Regiment, Railway Artillery.
- 4-41 Medical Detachment, Regiment, Railway Artillery.
- 4-42 Headquarters and Headquarters Battery, Regiment, Railway Artillery.
- 4-45 Battalion, Railway Artillery.
- 4-46 Headquarters and Headquarters Battery, Battalion, Railway Artillery.
- 4-47 Battery, Railway Artillery.
- 4-61 Regiment, Harbor Defense, Type "A."
- 4-61 Medical Detachment, Regiment, Harbor Defense, Type "A."
- 4-62 Headquarters and Headquarters Battery, Regiment, Harbor Defense, Type "A."
- 4-65 Battalion, Harbor Defense.
- 4-66 Headquarters and Headquarters Battery, Battalion, Harbor Defense.
- 4-67 Battery, Harbor Defense.
- 4-68 Battery, Searchlight, Harbor Defense.
- 4-69 Battery, Mine, Harbor Defense.
- 4-71 Regiment, Harbor Defense, Type "B."
- 4-71 Medical Detachment, Regiment, Harbor Defense, Type "B."
- 4-72 Headquarters and Headquarters Battery, Regiment, Harbor Defense, Type "B."
- 4-81 Regiment, Harbor Defense, Type "C."
- 4-81 Medical Detachment, Regiment, Harbor Defense, Type "C."
- 4-82 Headquarters and Headquarters Battery, Regiment, Harbor Defense, Type "C."
- 4-95 Battalion, Separate, Harbor Defense, Type "D."
- 4-95 Medical Detachment, Battalion, Separate, Harbor Defense, Type "D."
- 4-96 Headquarters and Headquarters Battery, Battalion, Separate, Harbor Defense, Type "D."
- 4-104 Mine Planter.
- 4-111 Regiment, Antiaircraft, Semimobile.
- 4-111 Medical Detachment, Regiment, Antiaircraft, Semimobile.

- 4-112 Headquarters and Headquarters Battery, Regiment, AA, Semimobile.
- 4-115 Battalion, Gun, Antiaircraft, Semimobile.
- 4-116 Headquarters and Headquarters Battery and Ammunition Train, Battalion, Antiaircraft, Semimobile.
- 4-125 Battalion, 37-mm. Gun, Antiaircraft, Semimobile.
- 4-155 Battalion, Separate, 37-mm. Gun, Antiaircraft, Mobile.
- 4-155 4-175 and 4-185, Medical Detachment, Battalion, Separate, AA.
- 4-156 Headquarters and Headquarters Battery and Ammunition Train, Battalion, Separate, 37-mm. Gun, Antiaircraft, Mobile.
- 4-175 Battalion, Separate, Gun, Antiaircraft Semimobile.
- 4-176 Headquarters and Headquarters Battery and Ammunition Train, Battalion, Separate, Antiaircraft, Semimobile.
- 4-185 Battalion, Separate, 37-mm. Gun, Antiaircraft, Semimobile.
- 4-227 Battery, Underwater Ranging, Harbor Defense.
- 4-222 Headquarters and Headquarters Company, Coastal Frontier.
- 4-232 Headquarters and Headquarters Company, Sector, Coastal Frontier.

PROGRAM FOR COAST ARTILLERY TRAINING FILMS

<i>Subject</i>	<i>Status</i>
Tactical Employment of the Antiaircraft Artillery Regiment.	Obsolete film now available. Picture plan being prepared for revised film.
Antiaircraft Artillery Gun Battery.	To be produced at Forts Totten and Tilden.
Antiaircraft Searchlight Battery.	To be produced at Forts Totten and Tilden.
Antiaircraft 37-mm. Gun Battery.	Picture plan being prepared.
Antiaircraft Machine Gun Battery.	Picture plan being prepared.
The AA Regiment-Training for Spotters.	Completed and now available for issue to antiaircraft units.
Employment and Operation of Submarine Mine Battery.	Completed and now available.
Fire Control and Position Finding—Seacoast	Picture plan in hands of The Chief Signal Officer.
12-inch Gun Battery, Barbette Carriage.	Picture plan completed and in hands of The Chief Signal Officer.
Tactical Employment of a Battery of 155-mm. Guns (Coast Artillery).	Completed and now available.
Employment and Operation of a Battery of Railway Artillery.	Picture plan completed and in hands of The Chief Signal Officer. Most of the photographic work has been completed.

PROGRAM OF COAST ARTILLERY FILM SLIDES

- *FS 4-1—Characteristics of Naval Targets.
 - **FS 4-2—Identification of Aircraft.
 - ***FS 4-3—Antiaircraft Artillery Guns and Accessories.
 - ***FS 4-4—Antiaircraft Automatic Weapons.
 - ***FS 4-5—Antiaircraft Searchlights.
 - FS 4-6—Fixed Weapons and Matériel, Seacoast Artillery.
 - FS 4-7—Mobile Weapons and Matériel, Seacoast Artillery.
- The following film slides, prepared by the Chief of Ordnance, are of interest to the Coast Artillery and are available for distribution:
- **FS 9-5—Ordnance Matériel—General, Railway and Seacoast Artillery.
 - **FS 9-6—Ordnance Matériel—General, Aircraft and Antiaircraft Artillery Guns.
 - **FS 9-7—Ordnance Matériel—General, Aircraft and Antiaircraft Artillery Fire Control, Machine Guns.

NOTE: A film slide is a series of still pictures, usually reproduced on 35-mm. film. Sixteen single frame pictures can be placed on each foot of film. This material takes the place of lantern slides and has the advantage of being cheaper and more convenient to handle. The relative cost of producing film slides as compared to lantern slides is about 1 to 40 and a strip of about 100 pictures may be carried in the vest pocket of a lecturer.

The showing of film slides requires a special projector, which to date has been issued only to the general and special service schools, corps area headquarters, ROTC units, and a few antiaircraft regiments. A wider distribution of these projectors is under consideration.

*Completed, but distributed only to ROTC units.

**Completed.

***Production under way—should be available for distribution shortly.

The United States Coast Artillery Association



The purpose of the Association shall be to promote the efficiency of the Coast Artillery Corps by maintaining its standards and traditions, by disseminating professional knowledge, by inspiring greater effort towards the improvement of matériel and methods of training and by fostering mutual understanding, respect and coöperation among all arms, branches and components of the Regular Army, National Guard, Organized Reserves, and Reserve Officers' Training Corps.

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The Coast Artillery Journal

COLONEL CHARLES THOMAS-STAHLE, Editor

The JOURNAL prints articles on subjects of professional and general interest to officers of all the components of the Coast Artillery Corps in order to stimulate thought and provoke discussion. However, opinions expressed and conclusions drawn in articles are in no sense official. They do not reflect the opinions or conclusions of the Chief of Coast Artillery or any other official or branch of the War Department.

The JOURNAL does not carry paid advertising. The JOURNAL pays for original articles upon publication. Manuscripts should be addressed to the Editor. The JOURNAL is not responsible for manuscripts unaccompanied by return postage.

News and Comment

Coast Artillery Association Election

The terms of office of three members of the Executive Council of the Coast Artillery Association expire December 31 of this year.

Because it is desirable to have as many members of the Executive Association as possible available for meetings in Washington, the nominating committee was somewhat restricted in its selection of officers. The fact that many worthy officers who reside at a distance from Washington were passed over in the selection is unfortunate, but a necessary submission to the laws of time and space.

The ballot form, for use by members of the Association to express their choice of council members will be found in the front of this issue of the JOURNAL. It is your Association—VOTE!

One member of the Executive Council will be chosen from each component of the Coast Artillery Corps. Short biographies of the nominees follow.

Lieutenant Colonel Stanley R. Mickelson, Coast Artillery Corps, is well known to most officers in the corps. Colonel Mickelson is on duty with the General Staff, in Washington. He is a graduate of the Army War College, the Command and General Staff School, and both the Advanced Engineering course and Battery Officers' Course at the Coast Artillery School.

Lieutenant Colonel Homer Case is a Missourian by birth and education. Colonel Case saw service with the railway artillery in France during World War I, is a graduate of the War College, the Command and General Staff School, and the Coast Artillery School. He has been detailed as instructor at the Coast Artillery School, and is at present with the Military Intelligence Division of the War Department General Staff.

Major Cyrus Q. Shelton has served in the Coast Artillery continuously since 1917. He entered the service as an enlisted man in April, 1917, and was commissioned in the Coast Artillery Reserve in March, 1918. He accepted a commission in the Regular Army July 1, 1920. He is a graduate of the Coast Artillery School, the Air Corps Tactical School, and the Command and General Staff School. Major Shelton joined the War Department General Staff in July, 1939.

Colonel Charles C. Curtis, commanding officer of the 213th Coast Artillery (AA), Pennsylvania National Guard, served on the Mexican border as regimental supply sergeant, was a lieutenant in the 109th Machine Gun Battalion during the World War, and after the war served with the 50th and 45th infantry regiments. Colonel Curtis was a reserve officer for about a year and a half, and reentered the guard in 1922. He took command of the 213th Coast Artillery in 1928. Colonel Curtis is Ad-

vertising Director of the *Call-Chronicle* Newspapers in Allentown, Penna.

Colonel Stuart G. Hall commands the 211th Coast Artillery (AA), Massachusetts National Guard, now at Camp Huilen, Texas. Colonel Hall was a World War flyer, and has been in the Massachusetts guard practically ever since. He has been G-1 and Chief of Staff of the 26th Division, and has commanded the 211th for three years. In civil life, he is vice president and manager of a large furniture store in Boston.

Colonel William D. Cottam commands the 241st Coast Artillery (HD), Massachusetts National Guard. Colonel Cottam was commissioned in the Coast Artillery Corps as a second lieutenant in 1911, and all his service has been with this branch. He was a major in the A.E.F., serving as executive of the 34th Coast Artillery Brigade. Colonel Cottam assumed command of the 241st September 16 of this year, and is now at Fort Andrews, Massachusetts, with his regiment.

Colonel Gordon L. Carter, Coast Artillery Reserve, commands the 542d Coast Artillery. Colonel Carter entered the Maine National Guard, Coast Artillery, in 1915, and has been in this branch ever since. He saw service in France as first lieutenant and captain, is a graduate of the Command and General Staff School, and has had frequent service during maneuvers and other training periods. Colonel Carter is an accountant and statistician for the Boston and Maine Railroad.

Lieutenant Colonel Claude M. Cade commands the 950th Coast Artillery. Colonel Cade is widely known as a cartographer, and has been an officer in the Coast and Geodetic Survey. He served with the Survey in Panama during the building of the canal, and was chosen to organize and direct surveys in Michigan. Colonel Cade is Professor of Civil Engineering at Michigan State College. He has a son who is a lieutenant in the Coast Artillery Reserve.

Lieutenant Colonel Charles I. Clark is one of the original group who founded the Coast Artillery Association. He commands the 530th Coast Artillery, and is very active in reserve affairs in the New York Area. Colonel Clark began his service in the New York National Guard before the war, and in France was one of three American officers detailed to the first High Burst Ranging School. He was an instructor in high burst ranging during the latter part of America's participation in the war. In civil life, Colonel Clark is engaged in the insurance business.

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Coast Artillery Association ROTC Medal Winners

The names of the winners of the 1940 awards of the United States Coast Artillery Association ROTC Medal are listed below. This medal, given each year to one outstanding student in each senior Coast Artillery ROTC unit, is awarded by the Association on the recommendation of a board of three members appointed by the P.M. S.&T. at the institution concerned.

The selection is made on a grading scale of one hundred points. Grades in academic subjects exclusive of military subjects carry a weight of thirty points; grades in military subjects, both theoretical and practical, rate forty points; personal qualifications, to include character, initiative, force, leadership, coöperation, loyalty, industry, military bearing, and neatness, count thirty points.

The award is made to a student who has finished his junior year, and is based on three years' military and academic work.

Awards were as follows:

University of Maine: Cadet Major Leon J. Breton of Rumford, Maine. Cadet Breton is a member of Scabbard and Blade, Tau Beta Pi, and Phi Kappa Phi. He won his letter in basketball during his sophomore year, and is recognized as a campus leader.

Massachusetts Institute of Technology: Cadet William M. Folberth, of Cleveland, Ohio. Cadet Folberth is studying mechanical engineering.

University of New Hampshire: Cadet William A. Gardner, of Concord, New Hampshire. Cadet Gardner is a student in the College of Technology, and is active in seven student activities.

University of Delaware: Cadet Staff Sergeant Edward H. Lynch. Cadet Lynch was rated second highest Junior student in the school of Engineering; he is an officer in Tau Beta Pi, and a student member of the American Institute of Chemical Engineering.

Fordham University: Cadet William Francis Schieffer, of The Bronx, New York. Cadet Schieffer is considered a model student for his consistently outstanding work both in the military and scholastic fields.

University of Pittsburgh: Cadet Colonel George Maruschak, of Altoona, Pennsylvania. Cadet Maruschak was first in ROTC standing at the university during the 1939-1940 school year. He is a former Regular Army Coast Artilleryman, and served in Panama.

Virginia Polytechnic Institute: Cadet First Lieutenant James Oscar Graves, of Roanoke, Virginia. Cadet Graves holds membership in five campus organizations. His ROTC average has been "A" consistently.

University of Alabama: Cadet Second Lieutenant John K. McKinley, of Tuscaloosa, Alabama. Cadet McKinley is studying Chemical Engineering. His Military Department record is "A plus."

Georgia School of Technology: Cadet Master Sergeant W. R. Sanderson, of St. Gabriel, Louisiana. Cadet Sanderson is studying Ceramic Engineering. He is a member of the ROTC rifle team which won the 4th Corps Area Hearst Trophy for 1940.

Mississippi State College: Cadet First Sergeant James Franklin Scoggin, Jr., of State College, Mississippi. Cadet Scoggin, a student in Chemical Engineering, has a college record of straight "A."

The Citadel: Cadet First Sergeant John Mitchell Lesesne, of Charleston, South Carolina. Cadet Lesesne is majoring in English, has had consistently high grades, and is a member of the Exhibition Drill Platoon.

University of Cincinnati: Cadet Second Lieutenant John A. Diehl, Cincinnati, Ohio. Cadet Diehl is studying Civil Engineering.

University of Illinois: Cadet Edmund L. DuBois, the son of Lt. Colonel Bird S. DuBois, C.A.C., has received nine other awards at Military Day ceremonies at the University, and is prominent in student activities and athletics.

Michigan State College: Cadet Lieutenant Eugene W. Kelley, of Buchanan, Michigan.

Kansas State College: Cadet Lieutenant Colonel Carlyle P. Woelfer, of Chicago, Illinois. Cadet Woelfer, at one time a Second Lieutenant, Infantry Reserve, has been a CMTTC candidate, a soldier in the Regular Army and a member of the National Guard. He is studying Milling Technology.

University of Kansas: Cadet Donald D. DeFord, of Alton, Kansas. Cadet DeFord is head of Scabbard and Blade at the university. His grades have been consistently high.

University of Minnesota: Cadet Niel M. Wreidt, of St. Paul, Minnesota. Cadet Wreidt is majoring in Chemistry, is captain of the university company of Pershing Rifles, and is a member of Scabbard and Blade and Acacia fraternities.

Washington University: Cadet Russell Woodford Henry of Maplewood, Missouri. Cadet Henry is studying Chemical Engineering, has earned two letters in track, has a military grade of 88% and a military efficiency rating of 91.

Texas A. and M.: Cadet First Sergeant Glenn H. Reynolds, of Albany, Texas. Cadet Reynolds is a member of the Ross Volunteers, the crack military drill unit at the college. He is studying Agricultural Engineering.

University of California (Berkeley): Cadet Cyril M. Peletz, of Stockton, California. Cadet Peletz is a member of four honor societies, and is interested in five other activities, holding office in several.

University of California (Los Angeles): Cadet Major Franklyn J. Michaelson, of Los Angeles. Cadet Michaelson is majoring in mathematics. He is a member of the ROTC rifle team.

University of San Francisco: Cadet Lieutenant Jack Lewis Monroe, of San Francisco. Cadet Monroe is a member of the ROTC rifle team, and is studying Economics. He is active in campus activities.

Utah State Agricultural College: Cadet Colonel Ralph M. Johnson, Jr., of Logan, Utah. Cadet Johnson has a chemistry scholarship at the University of California. He is a member of Scabbard and Blade and several other honorary fraternities.

University of Washington: Cadet First Lieutenant Robert I. Long, of Auburn, Washington. Cadet Long was awarded the medal during the Governor's Day program on May 16, 1940.

† † †

Flash!

Just as this issue of the JOURNAL was going to press word was received of the award of prizes in the Coast Artillery Association's 1940 Prize Essay Competition.

The concurrence of opinion of the judges was that none of the essays submitted warranted a First Prize award but that the essays submitted by the following named officers did warrant Honorable Mention:

Lieutenant Colonel J. D. MacMullen

Lieutenant Colonel T. R. Phillips

Captain Robert J. Wood

† † †

AA Notes in World War II

One or two night raiders (*German*) which came lower in the interests of bombing accuracy or lost height from causes beyond their control were subjected to intense but not always accurate A.A. fire. The inaccuracy can probably be excused on the grounds that the Luftwaffe's reluctance hitherto to fly at night has robbed many gun crews of practice, but they succeeded in shooting down at least three night raiders, and probably more. In daylight raids they claimed at least 25 last week. Their best day was August 31, when they shot down 15.

* * *

Broadcasting about the first Berlin raid, one of the pilots said that his machine was held in searchlights from the German frontier to Berlin and back, and hardly for one moment was it free from A.A. fire. Over Berlin the concentration of both was "formidable." Clouds covered the target area at first, but cleared enough to allow the crew to identify their objective and to bomb it thoroughly and accurately.—*The Aeroplane*, September 6, 1940. (*London*).

† † †

Antiaircraft Activity in the Russo-Finnish War

Le Vie dell' Aria, April 6, 1940. It has been estimated that the total number of Soviet aircraft brought down by Finnish antiaircraft artillery during the war amounted to 275—50 in December, 60 in January, more than 100 in February, and about 50 during the remaining period of hostilities. The average number of rounds fired for each aircraft destroyed was 54. The interesting point about these figures may be realized when one considers that at the beginning and end of the Great War, 1914-18, the average number of rounds required to bring down a single aircraft was 11,000 and 6,000 respectively. One battery alone is reported to have brought down more than 30 Soviet aircraft.—(*Reprinted from the Command and General Staff School Military Review.*)

British Notes on German Tactics

The Nazis are to pay the price of assuming that sea power could be overborne by air power. Their air force has been required, in the past few weeks, to assume the mantle of their exiguous and relatively inactive navy and, at the same time, to establish that "control without occupation" over Great Britain which British air strategists have been advocating for years as an ultimate aim against an enemy. If they could have left the naval warfare to a naval force, the Nazis could at least have concentrated everything they possessed in the Luftwaffe on bending Great Britain to their will on British soil. If they could have afforded to let the invasion of Great Britain wait, then they could have matched all their air strength against British naval power.

* * *

The Nazis set out with the evident belief that they could gradually sweep from their path the opposing fighters by smashing the aerodromes from which they worked. By lengthening the journeys the fighters would have to make, they hoped to improve the chances of their bombers of reaching important military targets without interference. Behind their strategy was a belief that the principle of the barrage in military operations could be lifted intact into the air. Short range work is the strong point of the Luftwaffe. By driving back the belt of shore-based fighters, it hoped to shorten the ranges within which it would have to fight a way to the objectives. Even if the plan had succeeded, it would have been vain because it could be countered largely by standing patrols.

* * *

How typical of the heavy German mind is this belief that an air force can batter its way forward like an army, advancing only when it has taken the enemy's defenses in front of it. How unlike the swift thrusts of the modern mechanized army is this insistence on sweeping instead of darting daringly through any hole that can be forced through the enemy's front. The trouble is that the Luftwaffe is unaccustomed to fighting its way forward, and yet is obsessed by the army idea of ensuring that there are no serious threats in its rear. In Poland, the army mopped up as the Luftwaffe smashed the defenses just ahead of it. In Belgium and France, the job of the Luftwaffe was the breaking of strong points in front of the army and the creation of congestion on the roads for the benefit of the army. Faced with the job of handling Great Britain without an army or a navy to back it, the Luftwaffe tries to perform the functions of both, as well as its own proper duty.

That is a mean and pedestrian conception of air strategy. It is meeting the fate of those who lumber along when they could be dashing swiftly for their goal. It is not in conformity with the principles of lightning war; it partakes more of the character of a war of attrition. It reveals a lack of confidence in the application of the full and disorganizing air offensive in the face of determined defense. In essence it seeks to copy the offensive method of

the R.A.F. without making allowance for the limitations imposed by the circumstances of the moment on the R.A.F. The British method is to hammer repeatedly the objectives whose destruction is likely to hamper most heavily the enemy's war effort. Smashing enemy aerodromes is part of the system of strategical defense. Attacking the oil plants and dumps, the railways, canals and other communications, the aircraft factories, munition works and shipyards is part of the offensive.—*The Aeroplane*, August 30, 1940. London.

1 1 1

Antiaircraft Artillery in the Polish Campaign

(Experiences of an Officer in a German Antiaircraft Battalion.)

On the whole, the German large antiaircraft matériel and motorcycle equipment gave a very good account of themselves. One fact must be borne in mind. During the training period, in order to spare the equipment, the movements of antiaircraft artillery were confined almost entirely to excellent German highways. In Poland, however, our experiences were limited to but one good road—Warsaw to Lodz—and in the main we were obliged to make constant use of the poor sandy roads. Our drivers deserve a great deal of credit for the excellent manner in which they handled their vehicles in the movements over very difficult terrain. Much trouble was experienced in maintaining the rate of speed necessary to afford protection at the proper time. No one had ever thought that the Poles could be driven back so rapidly. The roads of deep sand might even have been considered impracticable for the movement of tractors, which often had to be resorted to in order to dislodge the trucks that had become bogged down in the sand. Many of these movements were carried out during the night and those during the day were of such great length that the drivers had little time for rest and scarcely more to devote to maintenance. It was quite noticeable that the motor vehicle operators had acquired the spirit of the old horse-drawn organizations—"first the horse, then the rider," modifying this slogan into "first the engine, then the driver." In order to reduce poor stretches of road to a minimum it was necessary for the leader of each unit to conduct a preliminary reconnaissance over the route which he expected to travel.

In passing motor columns on dusty roads which were either poorly marked or not marked at all, the rôle of the motorcyclist was one of constant drudgery. His peacetime training showed its value; by strenuous effort his mission was usually accomplished. It is well to reflect how often the motorcycle messenger is sinned against. His employment on missions of minor importance should be deferred until such time when they may be included with others. Conserving his strength will increase his value and he will be on hand when required. With his single companion he is often confronted with situations that require independent action and that will test the resources of a man with steady nerves.

In modern war, involving the movement of masses, the march will always remain a problem, the solution of which, to a great extent, will be a deciding factor in victory or defeat. A clear conception of the manner in which it must be accomplished must be understood by the motor vehicle operator, as well as by the column commander. One column must not overtake another column. Columns which are halted on the road must not be passed until its commander has been informed. Otherwise the halted column may start while it is being overtaken, an action which will result in two parallel columns moving on the same highway. In the rear of a large column there should always be an officer charged with the mission of preventing other columns from attempting to outdistance it. When there is considerable traffic on the highway, experience has proven that the first phase of the movement should cover as long a stretch as possible and that the longer rests be confined to the last phase of the march.

Our aircraft had accomplished such thorough work in preparing the way, that during the first days we saw no enemy airplanes at all. Our attacking squadrons had power behind them and the destruction of the diving Stukas was terrible. When judged on the basis of the number of hostile planes encountered, it must be conceded that our unit did very good work. Out of five enemy planes that we recognized we brought down three. Due to our rapid advance and our overburdened system of communications it was difficult to maintain contact with the rear. Consequently too little was known concerning the victories won by the antiaircraft artillery. One battalion alone brought down seventeen planes and another twelve, accomplishments which did much to establish confidence in our arm and prove its worth. During one gloomy, drizzling morning, when the clouds lay but six hundred feet above a small Polish city and no one had expected the approach of a hostile plane, the sound of an engine was suddenly heard and for a moment an airplane flew ghost-like along the lower edge of the clouds. Instantly the airplane alarm signal was sounded. In the fog the nationality of the plane could not be determined, but the shadowy outline, well fixed in our memory, indicated it to be a single-seater pursuit PZL. The few seconds available were sufficient to enable two guns to get into action with the result that both guns fired a total of forty rounds before the plane disappeared from sight. A few seconds later we received a congratulatory message from the I Corps for bringing down the plane. The order to keep a man in the gunpointer's seat ready to fire at any time, born of the experience that every second is decisive, paid well in this particular case. I cannot help but reflect on the words of one of my former commanders, words which I also impressed on my organization, "The heaviest demands are made on the antiaircraft artilleryman; he must wait for days and

even weeks and then, suddenly, he is forced to perform quick and accurate work within a few seconds."

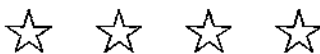
The reconnaissance of fire positions for heavy batteries cannot be started too early. It is only when we can fire from the very start far over the heads of our own infantry into the air space of the enemy, that we can place a sufficient number of shots in the air to give real protection, keep enemy reconnaissance planes far enough from our own lines and scatter his combat planes so that our fighters can make short work of them. This implies that the officer making the reconnaissance (battery commander or reconnaissance officer) must go forward with the infantry and make the reconnaissance as soon as the terrain is free of the enemy. Each gun position, as well as each change of position, must be determined well in advance and must be coordinated with each element of the command.

In the new fire position the battery commander must establish communications as soon as possible with the troops on his right, his left and to the front, in order to safeguard against the effect of hostile surprise. The protection of the flanks against scattered hostile forces, or against those which have effected a break-through, must be provided for constantly by the antiaircraft artillery.

At one time we were engaged in attacking a fort which had been putting up a stubborn defense. All available artillery would be required to break down its resistance. Upon offering the corps my batteries, one battery was released for this purpose and dispatched to the division needing it most. It was assigned to the front infantry line, a railroad embankment just high enough for our gun barrels to reach over and adequate for the protection of our crews. One gun was placed on the embankment, two were quickly intrenched, and the fourth was placed under cover and limbered up. As the infantry continued to sweep the enemy with fire, the light artillery smoked out a machine-gun nest and blew out the entire machine-gun emplacement; explosive shells knocked the enemy sharpshooters out of the trees, and then we began the bombardment of the fortress. It was in fights such as this that we won respect for our young arm.

The reconnaissance of positions for engaging ground targets is just as important as that made in the case of air targets. The approach and the return must be thoroughly considered and studied. Surprise is an important element of success and must be taken into consideration when going into position. While being drawn by a vehicle over the last stretch of 200 yards before reaching the emplacement, we covered the gun with an improvised iron shield.

The complex nature of our arm and the excellence of its equipment will continue to prove their value as the war progresses. We should understand clearly that the pride in our young arm is justified, and that it is our responsibility to increase and fortify it.—*Command and General Staff School Military Review.*



Coast Artillery Extension Courses for School Year 1940-1941

Courses used in 1939-40					Courses available in 1940-41					CS No.
CA Nos	Yr	TITLES	Les	Hrs	CA Nos	Yr	TITLES	Les	Hrs	
10-1	37-38	Organization of the Army	4X	7	10-1	40-41	Organization of the Army	4X	7	29
10-2	39-40	Organization of the C.A.C.	4X	11	10-2	39-40	Organization of the C.A.C.	4X	11	12
10-3	33-34	Administration	4	8	10-3	38-39	Defense Against Chem. Warfare	9X	20	25
10-4	39-39	Military Law-Law of Mil.Offenses	7X	15	10-4	40-41	Military Law-Law of Mil.Offenses	7X	16	25
10-5	32-33	Military Dis.,Court'y,& Cust.	3	6	10-5	32-33	Military Dis.,Court'y & Customs	3	6	23
10-6	39-40	Interior Guard Duty	3X	8	10-6	39-40	Interior Guard Duty	3X	8	17
10-7-I	39-40	Map & Aerial Photo. Reading	7X	15	10-7-I	39-40	Map Reading	7X	15	19
10-7-II	39-40	Aerial Photograph Reading.	3X	10	10-7-II	39-40	Aerial Photograph Reading	3X	10	19
10-8	33-34	Military Sanitation & First Aid	4X	10	10-8	40-41	Military Sanitation & First Aid	4X	10	26
10-9	37-38	Coast Artillery Ammunition	8X	20	10-9	40-41	CA Weapons,Materiel & Ammuni.	5X	18	
10-10-I	37-38	Coast Artillery Weapons & Materiel	10X	28	10-10	40-41	Basic Gunnery	3X	12	
10-10-II	"	"	8X	24						
20-1-I	35-36	C.A. Fire Con.& Position Find.	9X	26	20-1-I	35-36	*CA Position Find.System & App.	9X	26	
20-1-II	35-36	Pos.Find.& F.C. Organ. & Func.	7X	23	20-1-II	35-36	*Pos.Find.&F.C.Organ. & Func.	7X	23	
20-4-I	37-38	Supply	3X	8	20-2	40-41	Mess Management.	4X	10	22
20-4-II	37-38	Mess Management	4X	10	20-3	38-39	Military Law-Courts Martial	7X	18	24
20-5	37-38	Prop. Emergency,Procure.& Funds	5X	12	20-4	39-40	Care & Opera.Motor Vehicles	12X	27	5
20-6-I	36-37	AA Basic Gun,Fire Con.Pos.Find.	7X	21	20-5	40-41	Signal Communication--C.A.	4X	15	
20-6-II	36-37	AA Firing Data	8X	24	20-6-I	36-37	*Basic Gun.,F.C.& Pos.Find.AA	7X	21	
20-7	38-39	Defense Against Chem. Warfare	8X	19	20-6-II	36-37	*AA Firing Data	8X	24	
20-8	36-37	Signal Communication--C.A.	6X	11						
20-9	38-39	Military Law--Courts Martial	7X	18						
20-10	39-40	Care & Operation Motor Vehicles	12X	28						
30-1	38-39	Mobilization	5X	14	30-1-I	40-41	*SCA Weapons & Materiel	10X	30	
30-2-I	38-39	Orientation	7X	21	30-1-II	40-41	*SCA Ammunition	4X	15	
30-2-II	38-39	Trav.Res.,Intersec. & Leveling	6X	21	30-2-I	40-41	*AA Weapons & Materiel	9X	27	
30-3	34-35	Organization of Inf. Division	3-	6	30-2-II	40-41	*AA Ammunition	4X	15	
30-4-I	36-37	Combat Order	3X	10	30-3-I	40-41	Orient.,Instrs.& Azimuth Deter.	7X	21	
30-4-II	36-37	Solution of Problems	4R	14	30-3-II	40-41	Trav.Res.,Intersec. & Leveling	6X	21	
30-5-I	37-38	C.A.Preparation of Fire	9X	30	30-4-I	36-37	Combat Orders	3X	10	
30-5-II	37-38	C.A.Adjustment of Fire	11X	35	30-4-II	36-37	Solution of Problems	4R	14	
30-6-I	36-37	Gun.F.C.&P.F. for AA Arty. *	8X	26	30-5-I	37-38	*SCA Preparation of Fire	9X	30	
30-6-II	36-37	AA Observa.& Adjust. of Fire	7X	24	30-5-II	37-38	*SCA Adjustment of Fire	11X	35	
30-7	38-39	Fortifications for C.A.	9X	26	30-6-I	36-37	*AA Preparation of Fire	8X	26	
30-8-I	37-38	SCA Technique & Elemen. Tact. *	9X	25	30-6-II	36-37	*AA Observa. & Adjust. of Fire	7X	24	
30-8-II	37-38	El. Tactics-SC.,Ry. T.D. *	6R	20	30-7	38-39	Fortifications for C.A.	9X	26	
30-9-I	38-39	Technique of AA,M.G., & Acces. *	11X	30	30-8-I	37-38	*SCA Technique & Elemen.Tactics	9X	25	
30-9-II	38-39	Elemen.Tact. for AA & M.Guns *	5R	17	30-8-II	37-38	*Elemen.Tact.-CA.,Ry,TD & Fixed	6R	20	
					30-9-I	38-39	*Tech.of AA, M.Gun., & Access.	11X	30	
					30-9-II	38-39	*Elemen.Tact.for AA & M.Guns	5R	17	
					30-12	40-41	Administration	10X	35	1
					30-13	40-41	Advanced Map & Photo Reading	7X	24	2
40-1-I	39-40	HD Commander and his Staff *	7X	24	40-1-I	39-40	*HD Commander and his Staff	7X	24	
40-1-II	39-40	Ft.Group.,& Group Com.& Staff*	5X	18	40-1-II	39-40	*HD Ft.Group.,Group.Comd.& Staf	5X	18	
40-2-I	37-38	AA Brig.& Regimental Staffs *	6X	21	40-2-I	40-41	Training Management	3R	12	
40-2-II	37-38	AA Bn.Commanders & Staffs *	5X	16	40-2-II	37-38	*AA Brig.& Regimental Staffs	6X	21	
40-3-I	37-38	HD, TD,Ry. & Fixed Arty. *	8R	27	40-2-III	37-38	*AA Bn.Commanders & Staffs	5X	16	
40-3-II	37-38	SCA employed outside HD *	5R	18	40-3-I	37-38	*HD,TD,Ry. & Fixed Arty.	8R	27	
40-4-I	38-39	AA Def.on Marches & Concen. *	7R	24	40-3-II	37-38	*SCA employed outside HD	5R	18	
40-4-II	38-39	AA Arty. in Def.& Offense *	7R	25	40-4-I	38-39	*AA Def.on Marches & Concen.	7R	24	
40-5-I	35-36	Tactics & Technique of Inf.	10R	37	40-4-II	38-39	*AA Def. & Offense Positions	7R	25	
40-5-II	35-36	Tactics & Technique of F.A.	5R	20	40-7	40-41	Mobilization	5X	14	27
40-5-III	35-36	Tact.&Tech.Cav.,Eng.,Avia.etc.	6R	26						
40-6	34-35	Staff & Logistics for Div.	8-	34						
40-7	35-36	Training Management	3R	10						
50-1	36-37	Tactics & Tech. - Sep. Arms	12R	106	50-3	40-41	Employ. of Air Corps	6X	14	14
50-2	36-37	Tactical Principles & Decisions	8R	82	50-4	40-41	Organization of Inf. Division	3X	9	31
50-3	37-38	Tr.Lead.,Comd.,Staff & Logis.	5R	56	50-8	40-41	Problems in Combat Intelligence	6R	21	32
50-4	37-38	Tactical Principles & Decisions	8R	78	50-9	40-41	C.A. Local Security	4X	15	
60-1	37-38	Tactical Principles & Decision	5R	46	60-3-I	40-41	Tact.& Technique of Infantry	10R	33	38
60-2	37-38	Special Subjects	6R	66	60-3-II	40-41	Tact.& Tech. of Field Arty.	6R	21	38
					60-3-III	40-41	Tact.& Tech. of Cavalry & Mech.	6R	21	38
					60-3-IV	40-41	Tact.& Tech. of Misc.	7R	24	38
					60-5-I	40-41	Com.,Staff & Logistics for Div.	6R	21	8
					60-5-II	40-41	Do: Commander and Staff	7R	24	8

LEGEND:

* = Optional for HD Officers

= Optional for AA Officers

New Courses are underscored.

LEGEND:

- * = Optional for HD Officers
- † = Optional for AA Officers
- New Courses are underscored.

Coast Artillery Activities

OFFICE OF CHIEF OF COAST ARTILLERY

Chief of Coast Artillery

MAJOR GENERAL JOSEPH A. GREEN

Executive

COLONEL K. T. BLOOD

Matériel and Finance

LIEUTENANT COLONEL J. T. LEWIS
LIEUTENANT COLONEL S. L. McCROSKEY
LIEUTENANT COLONEL L. W. JEFFERSON
MAJOR C. VAN R. SCHUYLER
MAJOR F. B. KANE
MAJOR F. R. CHAMBERLAIN, JR.
SECOND LIEUTENANT D. B. SELDEN

Organization and Training

LIEUTENANT COLONEL H. N. HERRICK
COLONEL C. THOMAS-STAHLE
MAJOR J. E. HARRIMAN
MAJOR R. E. STARR
MAJOR C. N. BRANHAM
CAPTAIN A. SYMONS

Plans and Projects

COLONEL A. G. STRONG
LIEUTENANT COLONEL C. E. COTTER
LIEUTENANT COLONEL L. L. DAVIS

Personnel

LIEUTENANT COLONEL F. E. EMERY, JR.



Fort Monroe

MAJOR GENERAL FREDERIC H. SMITH, *Commanding*

BRIGADIER GENERAL FRANK S. CLARK
Commandant, Coast Artillery School

COLONEL WILLIAM S. BOWEN
President, Coast Artillery Board

COLONEL FRANCIS P. HARDAWAY
Post Executive; Commanding 2d Coast Artillery

COLONEL DELMAR S. LENZNER
Commanding, Submarine Mine Depot

LIEUTENANT COLONEL MANNING M. KIMMEL, JR.
Commanding, 57th Coast Artillery (TD)

LIEUTENANT COLONEL WILLIAM HESKETH
Commanding, 74th Coast Artillery (AA)

COLONEL MALCOLM W. FORCE
Commanding, 244th Coast Artillery

BRIGADIER GENERAL ROLLIN L. TILTON
Commanding General, Harbor Defenses of Chesapeake Bay

COLONEL ELI E. BENNETT
Executive, Third Coast Artillery District

COLONEL REGINALD B. COCROFT
Commanding, Virginia Beach State Camp

COLONEL HAROLD F. NICHOLS
Assistant Commandant, Coast Artillery School

LIEUTENANT COLONEL DALE D. HINMAN
Commanding, Fort Story and 71st Coast Artillery (AA)

COLONEL CHARLES C. CURTIS
Commanding, 213th Coast Artillery

COLONEL ALONZO E. WOOD
Commanding, 246th Coast Artillery

By Lieutenant Colonel Lloyd W. Goeppert and Captain Walter F. Ellis

In past years, the end of summer has signaled a break in the feverish pace that accompanies the training camps and the opening of the fall courses at the Coast Artillery School, but this year we have been caught in the whirl of expansion, and the pace has accelerated.

Since our last report, no event has caused more widespread interest at Fort Monroe than the induction of the National Guard into the federal service. With the arrival

during the fourth week in September of three regiments, our strength was more than doubled. The 246th Coast Artillery of the Virginia National Guard settled in tents at Fort Monroe and Fort Story, while the 213th of the Pennsylvania National Guard and the 244th of the New York National Guard occupy the Virginia Beach State Camp, south of Virginia Beach.

On October 1st, General Smith received a well deserved

promotion to the grade of Major General. The post on the morning of October 15th, paid honor to the general with a brigade review in which the 2d, 57th, 74th and 246th Coast Artillery regiments participated. It is the wish of everyone at Fort Monroe that General Smith will continue to make his headquarters here.

On October 10th, Brigadier General Frank S. Clark arrived to assume the duties of Commandant of the Coast Artillery School. In mid-November Brigadier General Rollin L. Tilton will arrive at Fort Monroe to assume command of the Harbor Defenses of Chesapeake Bay.

The new Submarine Mine Depot is a decided addition to the post. It is modern in appearance and appointments and yet blends nicely with other new permanent construction at Fort Monroe.

The station hospital is being rushed to completion. The façade will be one of the most pleasing studies in the symmetry of colonial architecture in Tidewater Virginia.

Work on temporary construction is proceeding at a feverish pace. There are already a number of buildings near completion in the vicinity of the Beach Club. The pumps are working on the fill at Camp Number 3, and the old stable has been razed to make way for the expansion of the Enlisted Specialists Department.

On October 2d, and again on October 28th, Fort Monroe played host to parties of visitors from South and Central American countries. Chiefs of Staff of practically every South and Central American nation visited the post and witnessed demonstrations conducted for them. Battery C, 2d Coast Artillery, fired 3-inch AA gun demonstrations; Battery D, 74th Coast Artillery, 37-mm. guns; Battery B, 57th Coast Artillery, 155-mm. guns; and other organizations displayed equipment for the inspection of the visitors. A reception and a stag smoker were held at the Casemate Club. Lieutenant Commander Aguayo and Lieutenant Bascunan of the Chilean Navy, who have been at Fort Monroe since September, 1939, accompanied the parties during their visits here and aided in overcoming the language difficulty.

The 2d Coast Artillery suffered a sad loss in the passing of Lieutenant Colonel Leroy H. Lohmann, Regimental Executive. The cheerful manner in which he conducted his duties, his understanding and appreciation of the problems of those under him, and his willingness to assist and cooperate wherever possible, endeared him to all. In his death we have lost a fine officer and a grand gentleman.

The 2d Coast Artillery continues to carry the lion's share of the Post special duty assignments. Battery C has done all the 3-inch AA gun firing for demonstrations and school problems. A, the mine battery, has been trying to conduct mine practice, but to date has been stymied at every turn by bad weather or more urgent demands on personnel and equipment.

The post volley ball and touch football schedules are now in progress. The enthusiasm for these sports has been very stimulating. All batteries are participating

and the scores indicate that they are well represented. Contests have been very close and scores low.

FIRST BATTALION, 57TH COAST ARTILLERY

By Captain Emmor G. Martin

Batteries A and B, commanded by Captains M. W. Tracy and A. A. Koscielniak, respectively, have completed preparations for annual target practices and are now awaiting clear weather and a clear field of fire. Headquarters Battery, Captain Howard W. Hunter, commanding, has been busy organizing and training its various details and sections.

A Provisional Searchlight Platoon and a Provisional Combat Train, composed of troops from Battery B, 2d Coast Artillery, are being trained under the supervision of the 57th. In addition to receiving training, the Searchlight Platoon has been assisting in the training of O.R.C. units, the Refresher Course Classes and Battery A, 74th Coast Artillery. To date the battalion is now completely equipped for field service. Guns and gun equipment, tractors and searchlights are the principal new items of controlled equipment that have been received. The main item of controlled equipment lacking is motor transportation.

The battalion is looking forward to expansion in the near future, and has been training cadres for that eventuality. Battery commanders are conducting schools for their reserve officers as well as schools for prospective first sergeants, supply and mess sergeants, cooks, clerks, etc.

While carrying a heavy training load the question of athletics and recreation has not been overlooked. Supervised athletics are the order of the day and occupy an important place in training schedules. All men are required to participate regularly in some form of athletics. In addition, each battery has entered teams in the Post inter-battery bowling, volleyball, touch-football and basketball leagues. Headquarters Battery and Battery A pried the lid off the touch-football schedule on October 5th. The game ended in a scoreless tie.

Captains Howard W. Hunter and Charles B. Duff were recently welcomed to the 57th. Captain Hunter relieved Captain Emmor G. Martin as Battery Commander of Headquarters Battery. Captain Duff has been assigned to Battery B.

FORT STORY

By Captain John I. Hincke

Fall finds events moving fast at Fort Story. Intensive forty-four hour a week training is taking place within all units. Included in the training program are overnight hikes. Camps are established in the Seashore State Park where defense against air attack and camouflage are stressed. During the past month one of the most important firing points for the Coast Artillery has been built along the shore on the reservation. This firing point provides space for two antiaircraft regiments, a 155 regiment, and the normal firing point for a seacoast regiment. From this firing point one can see 3-inch antiaircraft guns, all auto-

matic weapons, 155's, 8-inch railway guns and 12-inch railway mortars. Plans for several buildings to be erected to house guard details and matériel have been approved and foundations started. All normal enlisted specialists schools are in operation.

The buildings on the several projects on the post are well under way. A barracks area to house the 246th Coast Artillery, will be completed shortly. The regiment will abandon its present tent camp which has been developed into a model regimental camp. Additional housing for the 71st Coast Artillery (AA) is under way and will be completed by January 1st. A theater, several post exchanges, a guard house, an infirmary, two regimental administration buildings and a 250 bed hospital are only a few of the many buildings being erected.

In athletics, the inter-battery softball league has been completed, with Battery A, 71st Coast Artillery, (Captain E. B. Hempstead, C.O.) the winner. Their trophy, which was presented by Colonel Hinman at a gala battery dinner, was the first trophy to be won in the regiment. Outdoor boxing cards are still being held, drawing capacity crowds. A post football team has been organized under the coaching of Lieutenant Serena, 246th Coast Artillery, who plans games for each Sunday until Christmas.

A commodious and palatial Officers' Club has been built, using the old Coast Guard Station as a nucleus. The interior has been completely remodeled and tastefully decorated throughout. The club was opened with suitable ceremonies on November 2d.

74TH COAST ARTILLERY (AA)

By Major Clarence M. Mendenhall, Jr.

What was to become the 74th Coast Artillery (AA), originated in two batteries of the Provisional Coast Artillery Detachment from Fort Barrancas, arriving at Fort Story, Virginia, early in June, 1940. In July we moved to Fort Monroe, received key personnel from the 70th Coast Artillery, the 2d Coast Artillery and additional recruits, all of whom were organized into a peace strength antiaircraft gun battalion, and designated as the 74th Coast Artillery. The Battalion was quartered in Camp Number 2. July and August were occupied with organization, issuing of individual equipment, and recruit training. By the end of September, recruit training was completed, and a large share of personnel and matériel for Coast Artillery School and Board requirements were being furnished by the 74th Coast Artillery.

The battalion is to be expanded to a full war strength regiment soon after the first of the year. In the meantime, intensive training to develop additional first sergeants, gun commanders, clerks, cooks, mechanics, chauffeurs, and other operating instructors for this fast approaching expansion, is keeping everyone well occupied. Plans and space for additional barracks are earmarked for a specific priority of accomplishment and concrete foundation forms in different areas are springing up daily, followed by finished buildings almost weekly.

213TH COAST ARTILLERY (AA)

By Captain John F. Starr

The 213th Coast Artillery is now settled to routine duties at the Virginia State Camp, with 1,331 enlisted men, fifty-eight officers, and one warrant officer. Colonel Charles C. Curtis is in command and Lieutenant Colonel L. C. Atwood is regimental executive. Since the 15th of August the regiment has gone through a series of transformations due to the induction into federal service, discharging old personnel with years of service and enlisting recruits to fill the ranks. The regiment has covered approximately 2,000 miles since the 15th of August from home stations to the maneuvers in New York, back to home stations, and then to Virginia Beach. Social life is nil at this station due to lack of proper facilities and the intensive training program.

244TH COAST ARTILLERY

By Lieutenant Graham G. Berry

Exactly two weeks after the summer training period closed, AR 130-10 was applied, and the 244th Coast Artillery was inducted into federal service. Recruiting committees swung into action with authorization from the War Department to go up to full peace time strength, which was reached several days before the regiment left its home station for Virginia Beach. We arrived at Virginia State Camp on September 23rd and were under way on the training program the next morning. To date, emphasis has been placed on the basic training of the soldier, with recruits and old-timers alike shaping up rapidly. Artillery instruction began the week of October 14th, when recruits had their first opportunity to get a close look at the 155's to which they are assigned.

On the social side, the high-light of our Virginia stay to date has been the marriage, on October 12th, of Lieutenant James O. Murphy and Miss Adelaide Poppe, of New Jersey.

246TH COAST ARTILLERY

By Lieutenant Hilary E. Duval

On September 16, 1940 the 246th Coast Artillery (HD) of the Virginia National Guard, was inducted into the federal service for a period of one year.

The regiment is commanded by Colonel Alonzo E. Wood and is composed of seventy-eight officers, one warrant officer and 1,070 enlisted men.

During the first week of service in the Army of the United States all batteries remained at their home stations, at which time physical examinations, property check-ups, recruiting, and many other duties were performed along with initial training.

On Monday, September 21, 1940, the regiment entrained for designated concentration points. Regimental Headquarters, Regimental Headquarters Battery, and Second Battalion (less Battery E) consisting of Battalion Headquarters, Battalion Headquarters Battery, Battery

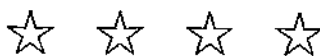
D and Battery F moved to Fort Monroe, Virginia. Searchlight Battery, Band, Medical Detachment, and 1st and 3d Battalions, consisting of 1st and 3d Battalion Headquarters, 1st and 3d Battalion Headquarters Batteries, and line Batteries A, B, C, G, H, I, and Battery E of the 2d Battalion entrained for Fort Story, Cape Henry, Virginia.

At the present time the men are quartered in pyramidal tents at both stations, but all men smile when they see skeletons of the barracks under construction. Each man is doing his best to make his tent home as comfortable as possible by building wardrobes, chairs and tables. The officers at Fort Monroe are living in temporary quarters while the conditions are much better at Fort Story. The

change from civilian life to that of a soldier is rapidly being made. Many kinks have been ironed out and with the spirit exhibited by all officers and men, this problem soon will be solved completely.

On Friday, September 26th, the Post Executive and Harbor Defense Commander of Chesapeake Bay, Colonel Francis P. Hardaway, made an inspection of our camp site and tent area. This inspection was made at Fort Story in the morning and at Fort Monroe in the afternoon.

With men from all professions in civilian life as a foundation from which to work, great things will be accomplished this year by the 246th Coast Artillery (HD) from the good old State of Virginia.



First Coast Artillery District

MAJOR GENERAL T. A. TERRY, *Commanding*

COLONEL RODNEY H. SMITH, *Executive*

LIEUTENANT COLONEL VERNON W. HALL
Training and Gunnery Officer

LIEUTENANT COLONEL ROBERT T. CHAPLIN
Adjutant

LIEUTENANT COLONEL JAMES G. DEVINE
Plans and Projects Officer

CAPTAIN GEORGE R. CAREY
Aide-de-Camp

The period since the publication of the last issue of the COAST ARTILLERY JOURNAL has seen many changes and great activity in this District. The 68th Coast Artillery (AA) has moved from Portland to its new station at Camp Edwards on Cape Cod. The 197th Coast Artillery (AA) and the 211th Coast Artillery (AA) have been inducted, and, after brief shake-down periods, have left for their training center at Camp Hulen, Texas. Four harbor defense National Guard regiments have been inducted into the federal service, the 240th Coast Artillery in the Harbor Defenses of Portland, the 241st Coast Artillery in the Harbor Defenses of Boston, the 242d Coast Artillery in the Harbor Defenses of Long Island Sound and the 243d Coast Artillery in the Harbor Defenses of Narragansett Bay. A number of new units have been formed in the Regular Army harbor defense regiments and preparations are being made for the activation of all units of these regiments. The Harbor Defenses of Portsmouth and New Bedford have awakened from their Rip Van Winkle sleep and are now bustling with activity. All regiments are now well launched into the intensive schedules of the Mobilization Training Programs, with special emphasis on the maximum possible amount of outdoor artillery training.

On September 26, 1940, General Thomas A. Terry arrived from the Harbor Defenses of San Francisco, which he commanded, to take command of this District. He was accompanied by his aide, Captain George F. Carey, CAC. On September 27, 1940, the War Department announced his promotion to the rank of Major General, effective on October 1. General Terry shortly after arrival started on a series of inspection trips to all of the Harbor Defenses

and to the AA Training Center at Camp Edwards. This inspection started with the Harbor Defenses of Portland on October 3d and ended with the Harbor Defenses of Long Island Sound on October 11th. All harbor defense units, including the newly inducted National Guard units, were inspected. At Camp Edwards, a review was held for General Terry by the 68th Coast Artillery (AA) and the 211th Coast Artillery (AA). The District staff has been increased by the addition of two new arrivals, Lieutenant Colonel Vernon W. Hall, C.A.C., and Lieutenant Colonel James G. Devine, C.A.C. Colonel William C. Koenig, C.A.C. has also been assigned to the District and is expected to arrive from the Philippines late in December.

CAMP EDWARDS

BRIGADIER GENERAL ROBERT C. GARRETT, *Commanding*
By Lieutenant James S. Webb

On September 16, 1940, the 68th Coast Artillery (AA) moved from the Harbor Defenses of Portland to its new station at Camp Edwards, Falmouth Massachusetts, where it is in tent camp pending the completion of cantonments. The regiment is engaged in intensive training, including target practice firings, in addition to recruit training.

To provide recreation, convoys are scheduled to neighboring cities over week-ends, and equipment recently installed in a tent by the U. S. Army Motion Picture Service makes possible moving pictures in camp every night. The gridsters have already embarked successfully on the season's schedule.



Major General T. A. Terry inspecting Battery A, 23d Separate Battalion, Coast Artillery, at Fort Rodman, Massachusetts

HARBOR DEFENSES OF PORTSMOUTH

MAJOR EDWARD G. COWEN, *Commanding*

By Lieutenant Robert W. Young

For twenty years, the forts of the Harbor Defenses of Portsmouth have been under the care of caretakers. Early in September the forts took a new lease on life. A cadre of thirty-three experienced enlisted men arrived at Fort Constitution on September 12th, and garrisoned the post. The initial cadre augmented by recruits will make up the 22d Coast Artillery, a reactivated regiment, which will garrison the Harbor Defenses of Portsmouth. The men are quartered temporarily in the hospital building at Fort Constitution until the quarters at the new reservation are completed early in November. The new reservation lies half way between Forts Constitution and Stark.

The initial program for the 22d Coast Artillery calls for a mine battery and a headquarters battery.

In keeping with its new status, the Harbor Defenses of Portsmouth were separated from the command of the Harbor Defenses of Portland on September 27th.

As soon as the men arrived a complete training program was drawn up for their instruction. A recreational program is being instituted for the men. At present, the athletic facilities consist of a softball diamond, a volleyball court, and an outdoor basketball court. A friendly rivalry exists between the cadre and the recruits, a situation which tends to make the games very interesting. Everything is being planned and organized in such a manner as to insure the ready absorption of any increase in the personnel of the regiment.

Colonel Walter K. Dunn is now under orders to join this regiment. Colonel Dunn will come from the Philippine Islands where he is now stationed.

HARBOR DEFENSES OF PORTLAND

COLONEL GEORGE E. FOGG, *Commanding*

By Captain Gerald G. Gibbs

The 240th Coast Artillery, Colonel George E. Fogg, commanding, was inducted into federal service on September 16. On the 24th of September the regiment

swung into its intensive training program as part of the Harbor Defenses of Portland.

The building of cantonments at Fort Levett is progressing rapidly and several of the old barracks have been rehabilitated and are ready for occupancy.

Recruiting for the 240th Coast Artillery, under Major Graham and Lieutenant Webber, has gone at a rapid rate and the regiment is near its authorized strength. At the present time artillery drill is in full swing with all batteries manned and it won't be long before we will have target practice.

The Officers Club opened with a reception given by the officers of the 8th Coast Artillery for the officers and ladies of the 240th Coast Artillery. Colonel and Mrs. Fogg and Colonel and Mrs. Kemble received.

The regimental headquarters of the 240th Coast Artillery is at Fort McKinley.

HARBOR DEFENSES OF BOSTON

COLONEL MONTE J. HICKOK, *Commanding*

By Captain H. D. Linl

The induction of the National Guard into the federal service resulted in a material increase in the strength of the Harbor Defenses of Boston. On September 23d, Colonel Hickok, Harbor Defense Commander, and the officers and men of the Regular Army of this Harbor Defense had the great pleasure of welcoming into the command the officers and men of the 241st Coast Artillery, Massachusetts National Guard, under command of Colonel William D. Cottam.

Both regiments are alert to their common mission and to their need for coöperation and mutual support. The 241st Coast Artillery after a brief adjustment period, is now participating in the organized training of this command.

To ascertain the requirements and progress of the Harbor Defense incident to expansion frequent inspections of training, supply and living conditions were made by officers from higher headquarters.

For future training, this past season's target practices may well serve as a criterion; the antiaircraft and seacoast and submarine mine practices were rated Excellent. The submarine mine practice was held without a single penalty.

HARBOR DEFENSES OF NEW BEDFORD

By Captain John H. Kochevar

Fort Rodman continues to expand—both in facilities and personnel. All permanent buildings, including barracks, officers' quarters, warehouses, and other facilities, have been completely rehabilitated and are now in use for the purpose for which they were originally intended. In addition, a tent camp for one hundred men is ready for occupancy and has been winterized for better protection against cold weather. It is expected that construction of

temporary buildings (mobilization type) sufficient to house further increases in the garrison, will be undertaken in the very near future.

Indoor and outdoor rifle ranges are being prepared, armament and its various accessories are being manned, and intensive training in all phases of Coast Artillery activity is well under way.

The garrison now consists of twelve officers and 150 enlisted men, including attached personnel of Medical Quartermaster, Ordnance and Signal Corps.

HARBOR DEFENSES OF NARRAGANSETT BAY

COLONEL EARL C. WEBSTER, *Commanding*

By Captain Virgil M. Kimm

On September 22, 1940, the 243d Coast Artillery, Rhode Island National Guard, Colonel Earl C. Webster, commanding arrived for duty in the Harbor Defenses. All the armament at Fort Adams, Wetherill, Getty and Kearney has been put into active service and assigned to units of the 243d. Battery Varnum, the old model, 12-inch battery, silent since 1911, will again spit fire and steel.

The Panama batteries left for their overseas assignments on September 30.

Batteries A and B, of the 10th Coast Artillery combined to conduct a mine practice which started on September 23d with the arrival of the USAMP *Baird*. During the planting of Number 16 mine on October 2, Private First Class Joseph Menditto, 6141369, Battery B, 10th Coast Artillery, became entangled in the heaving line aboard the L-boat and was pulled overboard on the end of the cable and drowned. The body was recovered in less than four minutes, but artificial respiration failed to revive the man.

Our new District Commander, Major General Terry, made his first inspection on October 9.

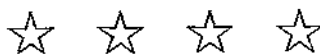
HARBOR DEFENSES OF LONG ISLAND SOUND

COLONEL THOMAS H. JONES, *Commanding*

By Lieutenant Joel T. Walker

The new intensified training program now in effect in these harbor defenses promises to make the approaching months busy and interesting from the standpoint of both the officers and men. The 242d Coast Artillery, Connecticut National Guard, now in federal service, has encamped at Fort Wright until the building program at Forts Terry and Michie will permit the regiment to move to those forts. Major General Thomas A. Terry made an inspection of the Harbor Defenses on October 11th.

The football season is well under way at Fort Wright with F Battery and Headquarters Battery leading the league. The Enlisted Men's dances, which were formerly held in the Service Club are now being held at the Y.M.C.A. in New London and have proved to be quite successful.



Hawaiian Separate Coast Artillery Brigade

MAJOR GENERAL FULTON Q. C. GARDNER, *Commanding*

COLONEL C. M. S. SKENE, *Chief of Staff*

LIEUTENANT COLONEL L. V. WARNER, *Adjutant General & S-1*

CAPTAIN D. D. MARTIN, *S-2 & Gunnery*

LIEUTENANT COLONEL J. H. LINDY, *S-3*

LIEUTENANT COLONEL R. M. PERKINS, *S-4*

MAJOR I. H. RITCHIE
Com. and Engineer Officer

CAPTAIN G. C. ESSMAN
Chemical Warfare Officer

LIEUTENANT COLONEL J. C. BATES
Sec. Ath. Officer

LIEUTENANT COLONEL R. S. BARR
Ordnance Officer

MAJOR N. D. FRANKLIN
Judge Advocate

COLONEL E. B. WALKER
Commanding Harbor Defenses of Pearl Harbor

COLONEL CHARLES K. WING
Commanding 64th Coast Artillery (AA)

LIEUTENANT COLONEL SHUEY E. WOLFE
Commanding Harbor Defenses of Honolulu

By Captain Milan G. Weber

SEARCHLIGHT REVIEW FOR LIEUT. GENERAL HERRON

On the night of September 27, 1940, the personnel of the Hawaiian Separate Coast Artillery Brigade passed in review under a canopy of searchlight beams in honor of the Department Commander, Lieutenant General Charles D. Herron, who had recently been invested with his new rank and title.

BATTLE PRACTICE

On September 12th, the Harbor Defenses of Pearl Harbor conducted a battle service practice in which eight sea-coast batteries emplaced along a 20,000 yard front participated. Two tugs towed a total of five targets during the practice. Coast Artillery officers acted as air observers for the practice. The details of the practice, together with pictures are being set forth in a separate article which is expected to be published in this or a succeeding issue of *THE COAST ARTILLERY JOURNAL*.

TARGET PRACTICES

In the conduct of target practices in this brigade under conditions approaching as nearly as possible those which would be encountered in time of war, several firings have been conducted which might be of interest to other Coast Artillery organizations. Among firings of this nature which have not been previously mentioned are:

Firings with Sandbag Revetments. Several 155-mm. firings have been conducted with sandbag revetments emplaced in front of the guns. It was found that the sandbags in the immediate front of the guns were thrown inward by the concussion of firing. In falling the bags were broken and dust was thrown throughout the vicinity, thus making Case II firing impracticable. This situation would be partially alleviated by a thorough wetting immediately prior to firing. However, water for this purpose, especially for mobile batteries emplaced at a dis-

tance from population centers, will not always be available in unlimited quantities. Furthermore, these batteries may be emplaced for months without action although a condition of readiness for instant action might have to be maintained. It would not be practicable, in many cases, to keep such an area continuously wetted down. These firings are mentioned here so that other organizations might give consideration to sodding such revetments or covering them with tarpaulins.

Antiaircraft firings with Camouflage Nets. Firings of 3-inch antiaircraft guns under camouflage nets have taken place at Malakole, the antiaircraft firing center. For these firings, an I-slit was cut into standard 36' x 44' camouflage net. The edges of the slit were selvaged to prevent unravelling of the net. At the time of firing, the two parts of the net outlined by the slit were thrown back and firing took place through the 10' x 10' opening. This proved to be entirely satisfactory; the gun crews were not hampered in their work and the shock of firing did not affect the net.

Night Antiaircraft Firing at Low Altitudes. Night firings with 3-inch guns at low altitudes have been conducted by the 64th Coast Artillery. It was found during these firings, that the flashes of the guns firing at frequent intervals blinded the trackers on the height finder and director to such an extent that tracking was difficult. It appears that the best practicable solution to meet this situation is the conduct of such firings with the director offset from the battery.

Antiaircraft Firings on Diving Targets. The 64th Coast Artillery has been experimenting with the conduct of fire against diving targets. Both 3-inch guns and machine guns have been fired against improvised targets thrown from a B-18 bomber. These firings have been conducted in order that the personnel may acquire some knowledge of the problems involved in the conduct of fire against dive bombers.

Harbor Defenses of Puget Sound

COLONEL JAMES H. CUNNINGHAM, *Commanding*

By Major Charles M. Myers

Fort Worden has been the scene of intense activity during the months of September and October due to the arrival of the 248th Coast Artillery, Washington National Guard. This regiment, commanded by Colonel Alfred W. McMorris, and consisting of 750 officers and men, arrived September 23d by motor convoy. Pending the completion of cantonments, the regiment is quartered in tent camps on the Hill and on the small parade ground in front of the hospital, with a few men down in the old CCC Camp.

In the meantime, cantonments are under construction on the slopes north of the hospital and other buildings will be placed on the small parade ground in front of the hospital as soon as the tent camp in that locality can be vacated. The cantonments also include a recreation building for each regiment and a combination dormitory-mess for Reserve officers.

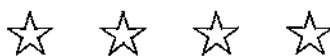
Intensive training is in full progress for the entire harbor defenses, including all-day and overnight marches for each unit as soon as the unit is properly trained and hardened. Regimental evening parades are held twice each week and one brigade review has been held.

There have been many changes in personnel. New ar-

rivals are Major Dave Sigel, CA-Res.; Captain Willard T. Day, Eng-Res.; Captain Samuel J. Newson, Med-Res.; Captain Gustav H. Mundt, CA-Res.; Captain Fred Timmerman, Sig-Res.; Captain Alfred H. Hopkins, Inf-Res.; Lieutenants Oliver F. Parker, QM-Res.; Marion W. Hubble, AG-Res.; Frank S. Hale, Eng-Res.; Gordon D. Lynch, Sig-Res.; Duane M. Metcalfe, CA-Res.; Robert C. Davie, Fin-Res.; and Thomas L. Chambers, MI-Res.

Lieutenants Peter Schmick, Roy E. Moore, Theodore F. Hoffman and Milton H. Clark have all been promoted to captain. Captain James E. McGraw left recently for Fort Monroe for duty on the Coast Artillery Board. Major Charles M. Myers has received orders for Panama and will leave soon.

Distinguished visitors to Fort Worden during the past two months have included the District Commander, Major General Henry T. Burgin, (who was sworn in as a Major General while here), Colonel McNarney, WD GS and Brigade General Stuart of the Canadian Army, and Admiral Freeman, Commandant of the 13th Naval District.



Panama Separate Coast Artillery Brigade

MAJOR GENERAL SANDERFORD JARMAN, *Commanding*

LIEUTENANT COLONEL C. R. FINLEY, *Executive*

MAJOR L. W. BARTLETT
Communications and Intelligence

CAPTAIN M. K. DEICHELMAHNN
Plans and Training

CAPTAIN C. G. PATTERSON
Adjutant

1st Coast Artillery (HD)
COLONEL A. J. FRENCH, *Commanding*

72d Coast Artillery (AA)
COLONEL H. R. OLDFIELD, *Commanding*

CAPTAIN W. M. SKIDMORE
Aide-de-Camp and Assistant S-3

CAPTAIN R. M. HARDY
Assistant Adjutant and Assistant Communications

LIEUTENANT COLONEL H. P. DETWILER
Munitions and Supply

4th Coast Artillery (HD)
COLONEL W. R. NICHOLS, *Commanding*

73d Coast Artillery (AA)
LIEUTENANT COLONEL W. M. CHAPIN, *Commanding*

For news of Panama, please turn to "The Coast Artillery in Panama," by Lieutenant Colonel Charles R. Finley.

Puerto Rico

MAJOR GENERAL E. L. DALEY, *Commanding*

By Captain Peter S. Peca

The Coast Artillery units in Puerto Rico have practically doubled in strength during the past three months. The 1st Battalion, 201st Coast Artillery, National Guard, has been inducted. The 66th Coast Artillery troops now stationed here will train the 201st Coast Artillery (AA). The 51st Coast Artillery will train the 253d.

The entire 51st moved to Borinquen Field about the 15th of September for its annual target practice season. The battalion functioned as a unit under the control of Lieutenant Colonel Flanigan. The preparations, training, and firing were most satisfactory. Five new lieutenants who had just arrived received very valuable practical training. Troops drilled perfectly and with great enthusiasm.

For tactical and training purposes a shift has been made in the location of units in the various Army posts. The 51st Coast Artillery with its Headquarters, is now located at El Morro. The 65th Infantry, less the 1st Battalion, has been moved to Fort Buchanan. The 66th and the 1st Battalion, 65th Infantry, are still stationed at Borinquen Field.

61ST COAST ARTILLERY

LIEUTENANT COLONEL B. L. FLANIGAN, *Commanding*

By E. J. Wallace, Jr.

On September 15 the battalion made a ninety mile march to Borinquen Field for a most welcome month of intensive field training. This was the first time in Puerto Rico that all elements of the battalion had been together under the direct command of the battalion commander. Advantage was taken of every opportunity for training. Night drills were conducted. Orientation data were checked on celestial bodies. Administrative and tactical matters were handled as a separate unit.

As for artillery work, two practices were fired by each battery—a special practice and the regular practice. That the firing was excellently prepared for and conducted is

evidenced by the fact that Battery B, commanded by Captain William G. Fritz, opened fire in the regular practice with two hits from a two gun salvo, and no corrections were necessary during the entire practice.

On October 12th the battalion moved from Borinquen Field to its new station, the Post of San Juan. Lieutenant Colonel Flanigan assumed command of the post. Headquarters Battery moved to historic El Morro. A Battery into San Cristobal, and B Battery moved to Fort Buchanan.

66TH COAST ARTILLERY (AA)

CAPTAIN J. E. MORTIMER, *Commanding*

By Captain E. A. Chapman

The months of August, September, and October have been hectic at Punta Borinquen. There was great rejoicing in August when the 66th Coast Artillery (AA) had an opportunity to fire its 3-inch guns at a towed target. We fired during the week of August 23d. The results were very good, considering the fact that it was our first chance to do actual firing in Puerto Rico.

On August 29th promotions for enlisted men arrived and were duly celebrated by the privates as well as the noncoms. Hardly had the battalion recovered from that windfall when it was set back on its heels by the news that Lieutenant Colonel Pitz, Captain Mortimer, and Lieutenants Schweidel, DeVille, and Smith, had been ordered back to the States, most of them to Fort Bragg.

On September 16th and 17th twenty-two enlisted men took the examination for the Coast Artillery School. We wish them a lot of luck.

As this goes to press, we are getting ready to move into our third set of temporary quarters. The increase in the Air Corps personnel at Borinquen Field makes this move necessary.



The 155's in Puerto Rico

Fort Bragg

By Lieutenant Colonel Harry R. Pierce

1ST BATTALION, 76TH COAST ARTILLERY (AA)

This organization was activated August 1, 1940 with colored enlisted men. On that date Majors Leon A. White and Andrew P. Sullivan, Captains Harry F. Townsend and Hubert du B. Lewis, 1st Lieutenants Robert H. Kessler and Raymond C. Cheal of the Regular Army and 1st Lieutenants John F. Ballentine, Thomas H. Rousseau, Russell S. Campbell and Jacob Frank, 2nd Lieutenants Isidor Rossoff, Joe O. Jennings, Alexander H. Lucas, James C. Parker, Reuben W. Mundy and Charles W. Matthews of the Reserves, reported and joined.

The honor of being the first enlisted members of the battalion falls to Corporals Eli Board and John J. Moore who arrived by private automobile on the 6th from the 2d Squadron, 10th Cavalry, at West Point. Other members of the regular army cadre arrived in the next few succeeding days from the 9th and 10th Cavalry and from the 24th and 25th Infantry, making the cadre practically complete by the 10th. Tents were issued and raised, messes organized, and preparation made for the arrival of recruits.

Recruits commenced to arrive in numbers on the 17th. By the 21st the authorized strength was reached and by the end of the month exceeded by 22.

Recruit training has been the order of the day from then to this writing, interspersed with organized athletics and games.

Four 3" AA guns arrived October 4th, two power plants October 5th.

Eight weeks of recruit training were completed on October 12th and terminated with final tests by the Post Commander.

A great part of the battalion energies during the following week was devoted to making the encampment neater and more comfortable, in anticipation of the coming cold weather.

Many pine saplings were cut for tent frames and the battery parades were covered with pine needles to keep the sand from being blown about by the wind.

Great praise was earned by the infantry and cavalry colored cadres because of their keen interest and enthusiasm in the training of recruits. This spirit was transmitted to the new men, who are off to a good start in learning the things that go into the makeup of the soldier. Although the 76th is one of the Coast Artillery's newest outfits, it shows every promise of making a name for itself.



"Soldiers are made. . ."

Corregidor News Letter

MAJOR GENERAL WALTER K. WILSON, *Commanding*

COLONEL FREDERIC A. PRICE, *Executive*

LIEUTENANT COLONEL L. J. BOWLER, *Adjutant and S-1*

MAJOR S. McCULLOUGH, *S-2*

LIEUTENANT COLONEL W. C. BRALY, *S-3*

LIEUTENANT COLONEL L. R. CREWS, *S-4*

COLONEL R. P. GLASSBURN
Commanding, 59th Coast Artillery (HD)

COLONEL WILLIAM C. KOENIG
Commanding, 60th Coast Artillery (AA)

COLONEL WILLIS SHIPPAM
Commanding, 91st Coast Artillery (PS) (HD)

LIEUTENANT COLONEL O. DECARRE
Commanding, 92d Coast Artillery (PS) (TD)

During these hectic days, Dame Rumor has a great time flying around and spreading tales of what may happen in the Philippines. The only real fact is that the situation here in the Far East is becoming more critical day by day. Every effort is being made and every measure taken to place the Philippine Department in a high state of preparedness for any eventuality. However, it appears from stories brought over here from the States by our new arrivals, that we out here are not as much worried about the situation in the Far East as many of our friends, back home.

At the time of writing this article, Typhoon Signal No. 1 is up and the weather is gradually getting worse. During the last two months, the rainy season has had its innings and with the exception of a few short periods of fair weather effective outdoor training has been impossible. However, much has been accomplished in getting plans, personnel, installations and material in a higher state of preparedness. Indoor training has consisted mainly of gunners' instruction and examinations, instruction in basic subjects, instruction in secrecy discipline, special schools for noncommissioned officers and key men, schools for specialists, instruction and firing of small arms, etc. Officers' schools in basic subjects, in artillery subjects, in tactics, and in special subjects have been completed. At present beach defense training and firing, and antiaircraft machine gun training and firing are being carried out in each regiment. We are preparing for an intensive period of instruction for the many new officers arriving on the next boat with the purpose of qualifying them for full field duty as soon as possible.

Major James W. Smith, Coast Artillery Corps (PS) well known to all coast artillerymen who have served at Fort Mills has returned from a leave of absence in the United States.

59TH COAST ARTILLERY

By Major A. K. Chambers

Two months of rainfall, broken only by short periods of fair weather, have afforded little time for outdoor training. However, the number of new expert gunners in the regiment speaks eloquently for the manner in which the indoor training periods have been utilized.

All batteries have completed small arms practice and have qualified a high percentage. Antiaircraft machine-gun firing and beach defense firing are next on our schedules.

Bowling and basketball have held the athletic spotlight for the past two months. Rumor hath it that a rookie member of the battery commanded by our capable and energetic regimental athletic officer posed the following question: "Captain, if the United States goes to war will we fight with basketballs or bowling balls." Our intelligence agents report that "Duke" failed to reply.

In the interbattery tenpin series Battery B finished in top place. In the interregimental series we were forced to bow to the brilliant bowling of our friendly enemies, the gallant Sixtieth.

Battery G won the interbattery basketball series. The interregimental series is just starting and we all expect Lieutenant Hauck's squad to bring home the bacon.

We have had many promotions, both commissioned and enlisted, in the past few days, but the space available in this letter does not permit the listing of the names of the fortunate ones.

On September 12th the regiment assembled at the Topside Ciné to celebrate its 22d birthday. Lieutenant Colonel Boudreau, commanding in the absence of Colonel Glassburn, acted as master of ceremonies and introduced the speakers. Colonel Glassburn, home on sick leave, honored the regiment by naming it one of his finest commands.

Lieutenant Colonel Charles P. Stivers, General Staff Corps, Department Athletic Officer, presented the Department baseball and basketball trophies to the regiment.

Painting a vivid word picture of the deeds of the regiment while yet in its swaddling clothes, Lieutenant Colonel Valentine P. Foster, 91st Coast Artillery, an officer who served "over there" with the 59th during the stirring days of 1918, raised the enthusiasm of his listeners to a high pitch. He left them with the feeling that they should "wear their regimental insignia as decorations."

Major General Walter K. Wilson, Harbor Defense Commander, briefly reviewed the accomplishments of the regiment in the past year, and then gave a most timely and inspiring address on our rights and privileges as American citizens and our obligations as American soldiers. The response of the members of the 59th to the forceful words of this natural leader should have been heard by that portion of our population that is in doubt as to America's ability to defend herself.

60TH COAST ARTILLERY

By Major G. L. Field

Since the last news letter, all training efforts have been

concentrated on our annual indoor period of gunners instruction and schools for both troops and officers. The arrival of the July transport presented new training problems when we were presented with eighty-eight Air Corps enlisted men to train as coast artillery until such time as coast artillery replacements become available. Within a short time these flyers have become good coast artillerymen, and it is our opinion that all concerned have benefited by the problem presented. September 3d opened our outdoor season, and from that time until the present all personnel have been placing emphasis on preparation for annual target practices soon to begin.

The regiment will lose its commanding officer, Colonel W. C. Koenig, upon the departure of the November transport *Grant* for the United States. The 60th deeply regrets losing Colonel Koenig, who, in his capacity as commanding officer, has in the past two years greatly improved the efficiency of the regiment. Colonel Koenig will be missed keenly, and the whole regiment joins in wishing him many future successes.

The 1939-40 athletic year ended with softball and duckpins, won by Batteries C and B, respectively. Battery B emerged the winner of the Regimental Commander's trophy for all-around athletic supremacy for the year.

In the new athletic year of 1940-41 interbattery tenpins and basketball are already completed, and boxing under way.

The regimental officers' tenpin team after the midseason loss of its number one bowler, Major Hogan, managed to fight through to finish the tournament in fourth place. The Department bowling tournament and congress begin in a few days, and the inter-regimental basketball playoff for the Post (American) championship has been completed with the 59th Coast Artillery winning two of the three games. The 60th, undaunted, regards the Department basketball tournament as still any team's prize. All in all a full season is anticipated with high hopes for success.

91ST COAST ARTILLERY (PS)

By Lieutenant Colonel V. P. Foster

During the past two months intensive training for beach defense firings was concluded and all units have now completed the field firings at towed targets. Antiaircraft machine gun firings are in full swing for 1st Battalion while the 2d Battalion is polishing off its training on anti-aircraft guns and searchlights.

In addition to organization duties they are attending schools of instruction daily which keeps them close to the well known grind stone.

With the rainy season holding sway during the past two months, the indoor sports of bowling and basketball occupied the athletic limelight. The duckpin tournament came first and provided intense competition and interest. Captain Stennis' Battery C bowlers led the pack at the conclusion of the race with Battery A in second place. The tenpin schedule got under way immediately following but

here the perennial champions, Battery G, stepped to the front and were never headed. Competition for second and third places was keener with four teams finishing only a game or two apart.

At the same time, the ever popular sport of basketball drew large crowds to every game. In this sport, Battery C proved unbeatable. It won all twelve of its scheduled games to lead the second place team, Battery E, by three games. For the first time in the history of the regiment, Battery C is the basketball champion and it left no doubts as to its right to wear the crown. The Regimental Team is formed for the series with the 92d Coast Artillery (PS) for the Post Championship (Scout Division) and for the Philippine Department tournament later in October and November. This team should be a favorite to win the department title.

In the basketball inter-battery tournament, Battery F, our outpost battery at Fort Frank, entered a team. Credit is due the organization for the hardships which it had to overcome in order to compete. The team complied strictly with the schedule despite several rough trips across South Channel.

92ND COAST ARTILLERY (PS)

By Lieutenant Colonel E. L. Barr

All batteries of the regiment are now completing their additional assignments in antiaircraft machine gun firing. Intensive training with emergency defense weapons has started which will culminate in day and night position firing during the period September 25th—October 19th. Instruction in small arms has also begun leading up to range practice in November.

The officers' regimental bowling team, winner of last year's post tournaments both in duckpins and tenpins, completed the tournament this year in the cellar, thus keeping the "C. I." where it should be.

The 92d regimental tenpin team won the post championship in the Philippine Scout division. In defeating the 91st regimental team 5 to 2, the 92d has made a clean sweep of bowling for the first time in many years, by winning the duckpins championship in July. All bowlers are now preparing for the department tournament to be held at Fort Mills in October.

Headquarters Battery won the inter-battery bowling tournament in tenpins after defeating the Guard Battalion in the extra matches, score 2 to 1. These two teams were tied for first place at the end of the tournament.

Repeating similar performances of the past several years, Battery C again won the championship in the inter-battery basketball league this year without a single defeat.

The regimental basketball team is now practicing daily under the management of First Lieutenant Robert J. Lawlor, Regimental Athletic Officer. The team is coached by Second Lieutenant Stephen C. Farris. With new blood on the team, the regiment expects to win the post basketball championship this year.

Coast Artillery Board Notes

Any individual, whether or not he is a member of the service, is invited to submit constructive suggestions relating to problems under study by the Coast Artillery Board, or to present any new problems that properly may be considered by the Board. Communications should be addressed to the President, Coast Artillery Board, Fort Monroe, Virginia.

THE COAST ARTILLERY BOARD

COLONEL WILLIAM S. BOWEN, C.A.C., *President*

LT. COLONEL FRANKLIN E. EDGEComb, C.A.C.

LT. COLONEL ELLSWORTH YOUNG, C.A.C.

LT. COLONEL WILLIAM F. GERHARDT, Ordnance Department

MAJOR ROBERT W. CRICLOW, Jr., C.A.C.

MAJOR ROBERT H. KREUTER, C.A.C.

CAPTAIN JAMES E. MCGRAW, C.A.C.

CAPTAIN CHARLES E. SHEPHERD, C.A.C.

CAPTAIN DONALD H. SMITH, C.A.C.

CAPTAIN MICHAEL M. IRVINE, C.A.C.

Caliber .30 Adapter for the Caliber .50 M2 Machine Gun Mount. The Board recently received for test an adapter to permit mounting the caliber .30 machine gun on the M2 mount. The design consists of a subcradle which is placed in the M2 antiaircraft mount in place of the caliber .50 M2 water-cooled gun. The caliber .30 Machine Gun M1917 on M1917A1 can be mounted with the center line of the barrel parallel with the center line position of the barrel of the caliber .50 gun. The gun is bolted to the subcradle, and the subcradle and caliber .30 machine gun can be mounted and dismounted as a unit. To balance the caliber .30 gun in this mount, a counterweight has been added at the forward end of the cradle. A caliber .30 ammunition chest bracket and cartridge guide were also furnished but it was found that a belt of caliber .30 ammunition could be placed in the caliber .50 ammunition box and fed out through the regular caliber .50 ammunition guide so that the additional bracket and guide were not necessary.

Approximately 8,000 rounds of ammunition were fired from each of the two machine guns mounted by means of the adapters. Firing was conducted as part of the training scheduled for organized reserve regiments and as part of the instruction at the Coast Artillery School.

As a result of the tests, the Chief of Coast Artillery recommended:

a. The caliber .30 machine gun adapter be made a standard accessory for the caliber .50 Machine Gun Antiaircraft Mount, M2.

b. One adapter be provided for each two mounts.

c. The caliber .30 ammunition chest and cartridge guide be not included as part of the adapter.

The future nomenclature of this item will be "Cradle, Subcaliber, A.A. Machine Gun Mount, M2."

Training antiaircraft machine gunners. The Board was recently directed to comment on a proposal to equip

each automatic weapon battery with skeet outfits. The possible advantages that might be obtained from this type of training are:

a. A definite demonstration of the necessity of leading a target.

b. An added interest in the training.

c. Inculcation of quick thinking and coordinated action.

The Board concurred in the statement appearing in a forwarding indorsement that the use of skeet shooting for the development of individual or central control of fire when tracers are used is of doubtful value. The records available indicate that since 1923 the Coast Artillery Board has been of the opinion that the advantages that might be derived from trap or skeet shooting would not justify the expenditure involved. The Board recommended that skeet shooting not be incorporated in the required training of automatic weapon units.

Records for antiaircraft searchlight power plant units. The power plants of portable searchlight units are classed as trailers, and as such it is necessary to maintain W.D., Q.M.C. Form 248, Motor Vehicle Service Record. This form was revised July 15, 1939, and is of the loose leaf type designed to be bound in the standard Kalamazoo binder. The form does not provide suitable space for recording essential data for the searchlight power plant.

In order to simplify and standardize the necessary records, the Board recommended that:

a. An additional page be printed for W.D., Q.M.C. Form 248. This page to contain ruled columns for recording the date, hours in operation, tachometer readings and the quantities of fuel and lubricants used.

b. Antiaircraft searchlight units maintain a record of minor repairs and replacements to portable power plants by proper entries on page 8 of W.D., Q.M.C. Form 248, by changing the main heading of page 8 to read "Motor Vehicle Record of Minor Repairs and Replacements," and

by changing the column now titled "Damage to Vehicle" to read "Cost and Nomenclature of Minor Units Repaired or Replaced."

c. An initial issue of ten of the additional pages be made with each portable antiaircraft searchlight power plant and that ten copies be furnished per power plant now issued.

Range drums for fixed guns. Due to recent changes in ammunition and firing tables applicable to fixed seacoast batteries, the range drums of certain fixed batteries are now incorrectly graduated for the service ammunition provided for that armament. The Coast Artillery Board has initiated action to correct this condition. Reports are now on hand showing the results of recent checks made on all fixed batteries. These reports have been carefully studied to determine where corrective measures are necessary. New elevation tables are being prepared for all batteries having incorrectly graduated range drums. In cases where more than one weight or type of service ammunition may be fired, the elevation tables are being prepared for the principal type or types of service ammunition comprising the battle allowance. These tables will be forwarded for use in regenerating the range drums. Instructions covering the necessary field work will be issued by proper authority.

Tractors. Two new types of tractors are now being issued to the Coast Artillery. Both tractors are designated as Tractor, M-1, Heavy. One type of tractor is manufactured by the Caterpillar Company and equipped with the "Hyster Winch" located in front of the radiator. This winch is driven by a propeller shaft which is under the body of the tractor and is operated by a clutch handle and brake from the driver's seat. The other type of tractor is manufactured by the International Harvester Company and is equipped with a "Gar Wood" winch which is driven by gears and propeller shafts located on the left side of the tractor. The "Gar Wood" winch is equipped with a safety brake on the worm drive shaft which holds the load under strain in any desired position.

To avoid damage to the jaw clutches, it is recommended that the following operating instructions be complied with in their proper sequence:

Caution: Never pull out *jaw clutch* when winch is under load. The jaw clutch is pulled out only to free the drum for unreeling cable to hook on load. Power take-off has only one forward speed and no reverse.

Operating cycle:

1. Pull out jaw clutch, pull off cable and hook on load.
2. Engage jaw clutch.
3. Depress engine clutch pedal.
4. Put power take-off shift lever in forward speed.
5. Release engine clutch pedal slowly and winch will start reeling in cable.
6. Stop winch by depressing engine clutch pedal.

(The load will be safely held by the safety brake on the worm shaft.)

7. If winch is under load when pull has been completed, move tractor forward to relieve strain so cable may be released.

Comments: The clutch pedal or the clutch hand lever can be disengaged when the winch is under load, but the jaw clutch or engaging gear segments can not be pulled out, for these parts are under heavy frictional pressure.

Each tractor is equipped with a hand brake which holds the winch in the "free spooling" position very satisfactorily. This brake was tested by making it hold or pull another tractor, as desired, and the brake held the load stable at any desired position.

Safe loading for a winch is computed as the pull which occurs when the drum is covered with one layer of rope. The proper size of rope for any winch usually has a breaking strain approximately the same as the normal "safe loading" of the winch. When the drum is half filled with rope, the safe rating is only 70% of normal; and when the drum is full, its safe braking load is only 50% of normal.

Oiling—Worm gear case. Fill to oil level hole with SAE 160 transmission oil in summer and SAE 110 in winter.

Safety Depression Stop for 3-inch Antiaircraft Guns. Safety regulations prescribe that no firing will be permitted over personnel not protected by overhead cover when the gun is laid at a quadrant elevation of less than 400 mils. In order to insure compliance with this requirement when antiaircraft guns are fired from the square formation, the Coast Artillery Board requested that the Chief of Ordnance develop a removable stop for limiting the minimum elevation of antiaircraft guns to 400 mils. Pilot models of stops for 3-inch antiaircraft guns were provided for test. These stops are mounted on the elevating rack and can be readily swung out of position when it is desired to depress the gun below 400 mils.

As a result of tests, the Board found the stops satisfactory and recommended that they be provided for all 3-inch antiaircraft guns. Depression stops will also be provided for the 90-mm. and 105-mm. guns. The recommendation of the Coast Artillery Board has been approved by the Chief of Coast Artillery.

Lighting device for Telescope of the Flank Spotting Instrument M-1. The Coast Artillery Board has recently tested a lighting device for the elbow telescope of the Flank Spotting Instrument M-1. The standard lighting equipment consists of one standard lighting device, an 8-foot cord and one Edison storage battery. The new lighting device tested by the Board consists of a light bulb, flashlight battery, and toggle switch, all mounted in one case and clamped to the telescope. A small red filter between the light bulb and reticle causes the illuminated scales to appear red in color.

The new lighting device illuminates the scales in a satisfactory manner. The red lighting provides a more satisfactory contrast with the white beam of the searchlight than does the white lighting used in the standard lighting device. The illumination appears uniform at all points on the scale and causes no blurring of the etching.

The new lighting device is light in weight and does not interfere in any way with the operation of the spotting instrument. From a viewpoint of weight, simplicity, and maintenance it is more satisfactory than the standard device.

No provision has been made for lighting the ϵ_m and \odot scales of the flank spotting instrument. The design of the instrument does not readily lend itself to the mounting of lighting devices for this purpose without interfering with operation. However, a small flashlight used by the reader provides a satisfactory means of illuminating these scales.

The Board recommended that the new type lighting device be standardized for use with the elbow telescope mounted on the Flank Spotting Instrument M-1 and that one Flashlight TL-122 be furnished with each flank spotting instrument. The Chief of Coast Artillery has approved this recommendation.

Loud-speaking Intercommunicating System for Seacoast Batteries. A loud-speaking intercommunicating system which provides a means for transmitting orders and reports and for two-way communication between the battery commander and the range and emplacement officers, has been tested at Battery DeRussy, Fort Monroe, Virginia. The system consists of a master station unit located in the battery commander's station and five substation units of the speaker microphone type located as follows:

- One in the plotting room.
- One in each of two gun emplacements.
- One in each of two magazines.

The system permits the battery commander, at the master station, to conduct two-way loud-speaking communication with personnel at the above-named substations either separately, to all stations simultaneously, or in selected groups. The equipment was tested during drill, subcaliber firing and a record service practice.

As a result of the test, the Coast Artillery Board concluded that the loud-speaking system offers no important advantages over the standard system employing the telephone and cordless switchboard. It is less rugged than the telephone and would present more of a maintenance problem. When there is need for two-way conversation, the advisability of permitting such conversations to be broadcast through a loud-speaking system to the entire range section or gun crew is open to question.

The Coast Artillery Board recommended that the loud-speaking intercommunicating system not be provided for fixed seacoast batteries. The recommendation has been approved by the Chief of Coast Artillery.

Crichlow Slide Rule. This is a device for solving trig-

onometric problems often met in antiaircraft artillery. It has been used in the service and at the Coast Artillery School for about four years. An explanation of the rule and its use appears in TM 4-110, Gunnery, Fire Control, and Position Finding for Antiaircraft Guns.

The Coast Artillery Board recently recommended that the rule in a durable form be standardized and issued to antiaircraft organizations as follows:

- a. One per antiaircraft gun battery. Six per regimental headquarters (for use by the regimental records section); and
- b. Six per harbor defense in which troops other than antiaircraft are required to train with antiaircraft matériel.

Antiaircraft Camera Spotting of High Explosive Bursts. Tests, which included experimental photography with antiaircraft spotting theodolite cameras, for the purpose of determining the best technique in photographing high explosive bursts were conducted by the Board at Fort Story and Fort Monroe during May, 1940. A reference to these tests appeared in the Coast Artillery Board notes included in the July-August, 1940, issue of THE COAST ARTILLERY JOURNAL. Additional tests authorized by the Chief of Coast Artillery were conducted by the Board at Fort Monroe during the period August 12 to 31, 1940. A physicist from the Signal Corps Laboratories was present and assisted the Board during both test periods.

In the first test period an opportunity was had to photograph high explosive shell bursts in firings conducted by the 70th Coast Artillery (AA) at Fort Story:

Type of Firing	No. of Rounds
Preliminary practices	50 (approx.)
Record day practices	186
Record night practices	80

In the second test period the bursts of sixty-three rounds of high explosive shell and twenty-four rounds of shrapnel were photographed during demonstration firings conducted by the Coast Artillery School at Fort Monroe. A small number of these shrapnel and high explosive bursts were photographed at night. In both tests four theodolites were used. This facilitated comparison of records obtained under identical conditions from the same point.

During the subject tests the spotting theodolites used were one set Type PH-BA-33 (Sperry) and one set Type PH-BC-33 (Mitchell). Photographs of high explosive bursts against a blue sky up to a slant range of 10,000 yards were obtained in which the images of the bursts were distinguishable. Photographic results were classified roughly as follows:

Time	Slant Range (yds.)	Results
Day	Up to 6,000	Good
	6,000 to 8,000	Fair to poor
	8,000 to 10,000	Poor
Night	Up to 7,800	Fair
	Above 7,800	No images on film were detected.

The tests indicated that the best photographic results

could be obtained through the use of ray filters in accordance with the following table:

FILTERS AND FILTER FACTORS (Wratten Designation)

Color of Burst	Sky Background	Color of Target	Type of Filter	Filter-Factor for Panchromatic Film
White	White	Red	5N5	12.5
White	Blue	White	29 F	8
			or	
			25 A	5
White	Blue	Red	5N5	12.5
Black	White	Red	5N5	12.5
Black	Blue	White	39	5
Black	Blue	Red	39	5

NOTE: If a 39 filter is not available when photographing black bursts against a blue sky, use no filter and open the camera aperture $1\frac{1}{2}$ stops more than indicated by the exposure meter. For example, if the exposure meter indicates an aperture of f 11, the proper setting would be f 6.3.

In collaboration with the representative from the Signal Corps Laboratories the Board reached a number of conclusions which were submitted to the Chief of Coast Artillery. Among these conclusions appeared the following:

a. Satisfactory photographic results cannot be expected at slant ranges exceeding 8,000 yards when using an anti-aircraft spotting theodolite equipped with a camera lens of 6-inch focal length.

b. The most suitable filter for use in photographing high explosive or black shell bursts against a blue sky is the Wratten No. 39 or equal.

c. Red filters are not suitable for photographing black colored bursts against a blue sky. For this purpose it is better to use no filter rather than a red filter.

d. A film emulsion speed rating of from 50 to 64 (Weston) is most suitable for use with the spotting theodolite cameras, both day and night.

e. In developing spotting camera film, the following are among the rules which should be observed:

- (1) Use Eastman D-11 developing solution or equal.
- (2) Keep the temperature of the developing solu-

tion, fixer and wash below 70 degrees Fahrenheit, using an external ice water bath if necessary.

(3) Do not develop more than 1,000 feet of film per each five gallons of developing solution.

(4) After fixing, wash the film in running water for one hour.

(5) After washing, and as it is being wound on the drying rack, wipe the film carefully with viscose sponges or moist chamois to remove excess water and foreign particles, thus insuring clean film free from water spots.

(6) Use a development time equivalent to five minutes in D-11 solution at 65 degrees Fahrenheit.

(7) Rewind film after removal from camera magazine before winding on the Stineman reel. This prevents the reel from marking the center of the photograph.

The Board recommended that each anti-aircraft spotting theodolite camera be provided with four ray filters of the following Wratten designations: 29 F, 25 A, 5N5 and 39.

Charts and Scales. The Coast Artillery Board is receiving numerous requests for charts and scales for use with fire control equipment. Many of the requests do not include sufficient information to identify properly the charts and scales that are desired, and in some cases erroneous information is furnished. Such requests cause undue waste of time and effort in attempting to decipher what is meant, or in returning the basic communication for further information.

Requests for charts and scales should include, where applicable, such information as: model of gun and carriage, weight and type of projectile, type of powder charge (normal or super charge, base and increment, or aliquot parts, etc.), firing tables which apply, type of fire control equipment, such as "Deflection Board M1."

Requests for range-range relation scales should state the weight and type of projectile for which the range drum is graduated.



The reward of a thing well done, is to have done it.

EMERSON.

Coast Artillery Orders

(Covering the period September 1, 1940, through October 31, 1940)

Because of the large number of promotions during this period they are not included in this list.

Colonel Clair W. Baird to Camp Upton.
Colonel Eli E. Bennett to Panama Canal Department, sailing New York, November 4.

Colonel Arthur G. Campbell to GSC with troops, 8th Corps Area, Fort Sam Houston.

Colonel Theodore M. Chase to Philippine Department, sailing New York, December 28.

Colonel Reginald B. Cocroft to 3d Coast Artillery District, Fort Monroe.

Colonel Avery J. Cooper to Governors Island.

Colonel Walter K. Dunn (GSC) to 22d, Fort Constitution.

Colonel Philip S. Gage to 7th, Fort Hancock.

Colonel Albert Gilmer to Philippine Department, sailing New York, December 28.

Colonel Robert P. Glassburn to 9th Coast Artillery District, Presidio of San Francisco.

Colonel Ralph E. Haines to 70th, Fort Moultrie.

Colonel Francis P. Hardaway to 13th, Fort Barrancas.

Colonel John H. Hood to 75th, Fort Lewis.

Colonel Franklin Kemble to 52d, Fort Hancock.

Colonel Allen Kimberley to 3d, Fort MacArthur.

Colonel William C. Koenig to 1st Coast Artillery District, Boston.

Colonel Olin H. Longino to 20th, Fort Crockett.

Colonel Rufus F. Maddux to San Francisco, Port of Embarkation.

Colonel Henry C. Merriam to Headquarters, Second Army, Chicago.

Colonel Charles B. Meyer to Massachusetts Military Reservation, Falmouth.

Colonel Hollis LeR. Muller to Hawaiian Department, sailing New York, November 23.

Colonel William R. Nichols to GSC with troops, 4th Corps Area, Atlanta.

Colonel Christopher D. Peirce to 13th, Fort Moultrie.

Colonel Frederic A. Price to 3d Coast Artillery District, Fort Monroe.

Colonel Edward W. Putney to his home to await retirement.

Colonel Arthur E. Rowland to 69th, Fort Crockett.

Colonel George Ruhlen to 21st, Fort Dupont.

Colonel Rodney H. Smith to 62d, Fort Totten.

Colonel Edward A. Stockton, Jr. to 6th, Fort Winfield Scott.

Lieutenant Colonel Henry R. Behrens to 2d, Fort Monroe.

Lieutenant Colonel George Blaney to 2d, Fort Monroe.

Lieutenant Colonel Joseph D. Brown (GSC) to 9th Coast Artillery District, Presidio of San Francisco.

Lieutenant Colonel George H. Collins to 7th Training Center, Leon, Iowa.

Lieutenant Colonel James L. Craig to 244th, Virginia State Camp, Virginia Beach.

Lieutenant Colonel James G. Devine to Headquarters, 1st Coast Artillery District, Boston.

Lieutenant Colonel Percy F. Fleming (FA) to Panama Canal Department, sailing San Francisco, October 18.

Lieutenant Colonel Russell T. George to 243d, Fort Adams.

Lieutenant Colonel Roy S. Gibson (Inf.) to Camp Upton.

Lieutenant Colonel Donald B. Greenwood to 8th, Fort Preble.

Lieutenant Colonel Vernon W. Hall to Headquarters, 1st Coast Artillery District, Boston.

Lieutenant Colonel John H. Harrington to GSC with troops, Headquarters, 4th Army, Presidio of San Francisco.

Lieutenant Colonel Charles S. Harris to Fort Sam Houston.

Lieutenant Colonel Charles J. Herzer to 23d Separate Battalion, Fort Rodman.

Lieutenant Colonel Daniel W. Hickey, Jr. to 9th Coast Artillery District, Presidio of San Francisco.

Lieutenant Colonel Ira B. Hill to GSC with troops, 1st Corps Area, Boston.

Lieutenant Colonel Clifford D. Hindle to instructor, Coast Artillery School.

Lieutenant Colonel Harold R. Jackson to 241st, Fort Banks.

Lieutenant Colonel Creighton Kerr to Fort Monroe.

Lieutenant Colonel Rolla V. Ladd to 20th, Fort Crockett.

Lieutenant Colonel Abraham M. Lawrence to 2d, Fort Monroe.

Lieutenant Colonel LeRoy Lutes to Fort Sam Houston.

Lieutenant Colonel Robert W. McBride to 203d, Camp Hulen.

Lieutenant Colonel William F. Marquat to 9th Coast Artillery District, Presidio of San Francisco.

Lieutenant Colonel Robert E. Phillips to 242d, Fort H. G. Wright.

Lieutenant Colonel Otto G. Pitz to duty with Organized Reserves, Pittsburgh.

Lieutenant Colonel Adam E. Potts to GSC with troops, Hawaiian Department, Fort Shafter.

Lieutenant Colonel Joshua D. Powers to 69th, Fort Crockett.

Lieutenant Colonel Carroll G. Riggs to instructor, Michigan National Guard, Detroit.

Lieutenant Colonel Lucas E. Schoonmaker to instructor, Coast Artillery School.

Lieutenant Colonel Cedric M. S. Skene to 63d, Fort MacArthur.

Lieutenant Colonel James R. Townsend to General Staff Corps.

Lieutenant Colonel Robert H. Van Volkenburg to Presidio of San Francisco.

Lieutenant Colonel James deB. Waibach to 252d, Fort Moultrie.

Lieutenant Colonel Ellsworth Young to Coast Artillery Board, Fort Monroe.

Major Edward F. Adams (Inf.) to 9th Coast Artillery District, Presidio of San Francisco.

Major George M. Badger to General Staff Corps.

Major Thomas Bagley, Jr., CA-Res. to active duty, Fort Monroe.

Major Charles N. Branham to Office, Chief of Coast Artillery.

Major George W. Brent to 10th, Fort Adams.

Major Lathrop R. Bullene to 67th, Fort Bragg.

Major Milo G. Cary to GSC with troops, 2d Corps Area, Governors Island.

Major John F. Cassidy to 198th, Savannah.

Major Frederick R. Chamberlain, Jr. to Office, Chief of Coast Artillery.

Major Mario Cordero to 61st, Fort Sheridan.

Major Charles H. Crim to retire, September 30.

Major Bernard C. Dailey to 20th, Fort Crockett.

Major Robert E. DeMerritt to instructor, Coast Artillery School.

Major Lee A. Denson, Jr. to General Staff Corps.

Major Hamilton P. Ellis to 2d, Fort Monroe.

Major E. Carl Engelhart to GSC with troops, Philippine Department.

Major John H. Featherston to GSC with troops, 4th Corps Area, Atlanta.

Major Bonner F. Fellers to military attaché, Cairo, Egypt.

Major Alexander L. Haggart to Panama Canal Department, sailing Charleston, November 29.

Major August W. Harris to Wright Field and Patterson Field.

Major Frederic L. Hayden to GSC with troops, Sixth Corps Area, Chicago.

Major Harry W. Lins to 240th, Fort Preble.

Major Percy L. Low to 9th, Fort Banks.

Major Frank C. McConnell to 202d, Fort Bliss.

Major Charles M. Myers to Panama Canal Department, sailing San Francisco, December 24.

Major Cornelius W. O'Leary (QM-Res.) CA-Res. to Camp Lee.

Major William H. Papenfoth to 211th, Camp Hulen.

Major John H. Pitzer to 20th, Fort Crockett.

Major Isaac H. Ritchie orders to instructor, Coast Artillery School, revoked.

Major Joseph S. Robinson to 20th, Fort Crockett.

Major William E. Ryan CA-Res. to Camp Brownwood.

Major Morris Whitmore CA-Res. to Camp Savannah.

Major Ellis V. Williamson (FA) to 74th, Fort Monroe.

Major Charles M. Wolff to 9th Coast Artillery District, Presidio of San Francisco.

Major Fred J. Woods to Panama Canal Department, sailing New York, November 4.

Major Ellsworth Young to instructor, Coast Artillery School.

Captain Robert Walton Andrews CA-Res. to active duty, Savannah Airport, Georgia.

Captain Charles O. Baird, Jr. CA-Res. to active duty, Mitchel Field.

Captain Albert S. Baron to 78th, March Field.

Captain Herbert T. Benz to 20th, Fort Crockett.

Captain George P. Berilla, Jr. (CAV) to Panama Canal Department, sailing New York, December 21.

Captain Kenneth M. Briggs to Panama Canal Department, sailing New York, November 4.

Captain Lyle A. Brooks CA-Res. to active duty, Savannah Airport, Georgia.

Captain Lawrence E. Brooks CA-Res. to active duty, MacDill Field.

Captain Laurence H. Brownlee to Panama Canal Department, sailing New York, November 27.

Captain Donald N. Cameron CA-Res. to active duty, Langley Field.

Captain Clifton C. Carter to Headquarters and Headquarters Company, II Corps, Fort Jay.

Captain Edgar N. Chace to instructor, Coast Artillery School.

Captain Wells Collett CA-Res. to active duty, March Field.

Captain John A. Croghan CA-Res. to active duty with Assistant Secretary of War.

Captain Cullen J. DeGraw, CA-Res. to active duty, Hamilton Field.

Captain W. George Devens to Ordnance Department.

Captain Harold G. Dresser CA-Res. to active duty, Fort Monroe.

Captain Charles E. Dunham to Panama Canal Department, sailing New York, November 27.

Captain F. Leslie Ebersole, Jr. CA-Res. to active duty, Savannah Airport, Georgia.

Captain Frederic H. Fairchild to Panama Canal Department, sailing San Francisco, December 24.

Captain George Fein CA-Res. to active duty, Mitchel Field.

Captain George A. Ford to 10th, Fort Adams.

Captain Arthur L. Fuller, Jr. to instructor, Coast Artillery School.

Captain Norman L. Geidel CA-Res. to active duty, Langley Field.

Captain J. T. Gettys, Jr. CA-Res. to active duty, Savannah Airport, Georgia.

Captain Sanford J. Goodman to 78th, March Field.

Captain Wesley N. Gordon CA-Res. to active duty, Mitchel Field.

Captain Walter G. Gosser CA-Res. to active duty, instructor, Coast Artillery School.

Captain Alexander Grendon CA-Res. to active duty, instructor, Coast Artillery School.

Captain Emory E. Hackman to Panama Canal Department, sailing New York, November 4.

Captain Paul A. Hastings CA-Res. to active duty, Coast Artillery School.

Captain Wilbur Lewis Haven CA-Res. to active duty, March Field.

Captain Firman K. Hayman CA-Res. to active duty, Langley Field.

Captain Glen E. Hofto CA-Res. to Alexandria, Louisiana.

Captain Harold H. Hunt (FA) to Panama Canal Department, sailing San Francisco, November 30.

Captain Henry A. Johnson, Jr. CA-Res. to active duty, Quartermaster Corps Reserve.

Captain Robert J. Jones CA-Res. to active duty, Fort Monroe.

Captain Virgil M. Kimm to Panama Canal Department, sailing New York, November 4.

Captain James E. McGraw to Coast Artillery Board, Fort Monroe.

Captain Edward W. McLain to 20th, Fort Crockett.

Captain James P. Maloney CA-Res. to active duty, Fort Monroe.

Captain Robert F. Moore to 21st, Fort DuPont.

Captain John E. Mortimer to 67th, Fort Bragg.

Captain Orville W. Mullikin (Inf.) to 10th, Fort Adams.

Captain James Nesmith, 2d, CA-Res. to active duty, Fort Monroe.

Captain Harold H. Newman CA-Res. to active duty, Adjutant General's Department Reserve.

Captain Walter C. Niederluecke CA-Res. to active duty, Randolph Field.

Captain George L. Otterson CA-Res. to active duty, Mitchel Field.

Captain Driscoll Otto CA-Res. to active duty, Randolph Field.

Captain Percy A. Rooks, Jr. CA-Res. to active duty, March Field.

Captain Willard G. Root to Panama Canal Department, sailing San Francisco, October 18.

Captain Walter A. Rude to Panama Canal Department, sailing Charleston, November 29.

Captain Charles H. Scott CA-Res. to active duty, Southern California Military District.

Captain Lawrence E. Shaw to Panama Canal Department, sailing San Francisco, March 11.

Captain Joseph P. Shumate to Panama Canal Department, sailing Charleston, November 29.

Captain Norman A. Skinrood to 9th, Fort Banks.

Captain Arlo L. Steele CA-Res. to active duty, Barksdale Field.

Captain Wilfred A. Steiner CA-Res. to active duty, Randolph Field.

Captain Arthur Symons CA-Res. to active duty, Office of the Chief of Coast Artillery.

Captain Elbert W. A. Taylor CA-Res. to active duty, March Field.

Captain Charles H. Treat (Inf.) to Panama Canal Department, sailing New York, March 15.

Captain Bennett M. Venable CA-Res. to active duty, Air Corps.

Captain Benjamin M. Warfield to 20th, Fort Crockett.

Captain Seth L. Weld, Jr. to instructor, Coast Artillery School.

Captain James Lloyd Williams CA-Res. to active duty, Langley Field.

Captain Wayne L. Wood CA-Res. to active duty, Fort Monroe.

Captain William F. Woolridge CA-Res. to active duty, Coast Artillery School.

Captain William J. Worcester to Panama Canal Department, sailing New York, November 4.

Captain Lewis J. Workman CA-Res. to Camp Hulen.

Captain William J. Weust, CA-Res. to active duty, instructor, Coast Artillery School.

Captain Boyd Yaden, CA-Res. to active duty, Hamilton Field.

First Lieutenant Herbert C. Armstrong CA-Res. to Hawaiian Department, sailing San Francisco, December 4.

First Lieutenant James O. Baker transferred to Ordnance Department.

First Lieutenant Marshall W. Baker CA-Res. to active duty, Coast Artillery School.

First Lieutenant Raymond Bail CA-Res. to Hawaiian Department, sailing San Francisco, September 19.

First Lieutenant John McM. Banks to Panama Canal Department, sailing Charleston, December 23.

First Lieutenant William H. Barnett to Camp Hulen.

First Lieutenant Donald E. Barrett CA-Res. to Hawaiian Department, sailing San Francisco, December 17.

First Lieutenant William W. Bell CA-Res. to Panama Canal Department, sailing New York, October 1.

First Lieutenant John B. Bomar, CA-Res. to active duty, Municipal Airport, Tuscaloosa, Alabama.

First Lieutenant Harry W. Brown, CA-Res. to active duty, Municipal Airport, Orlando, Florida.

First Lieutenant Woodrow W. Bryant CA-Res. to active duty, Maxwell Field.

First Lieutenant James E. Burch CA-Res. to active duty, Love Field.

First Lieutenant Robert E. Butts, CA-Res. to Hawaiian Department, sailing San Francisco, September 19.

First Lieutenant Robert W. Callaway CA-Res. to Philippine Department, sailing San Francisco, January 17.

First Lieutenant Robert J. Campbell CA-Res. to active duty, Fort Monroe.

First Lieutenant William C. Carr CA-Res. to Alexandria, Louisiana.

First Lieutenant Edgar N. Chace to 74th, Fort Monroe.

First Lieutenant Charles B. Duff to 57th, Fort Monroe.

First Lieutenant Robert H. Dunlop, Jr. CA-Res. to Hawaiian Department, sailing San Francisco, December 4.

First Lieutenant Galen P. Eaton to Panama Canal Department, sailing San Francisco, October 18.

First Lieutenant Oscar G. Ellis, CA-Res. to active duty, Maxwell Field.

First Lieutenant Jack G. Engelbert CA-Res. to active duty, Maxwell Field.

First Lieutenant William G. Fritz to 76th, Fort Bragg.

First Lieutenant Kenneth Gladt to 78th, March Field.

First Lieutenant Willis M. Gooch, Jr. CA-Res. to active duty, Randolph Field.

First Lieutenant John V. Gressang, CA-Res. to active duty, Langley Field.

First Lieutenant Arne W. Hazland CA-Res. to Hawaiian Department, sailing San Francisco, December 4.

First Lieutenant John C. Harvell CA-Res. to active duty, Orlando, Florida.

First Lieutenant Raymond Hass CA-Res. to active duty (QMC-Res.) Camp Blanding.

First Lieutenant Peter A. Helfert CA-Res. to Hawaiian Department, sailing San Francisco, September 19.

First Lieutenant William J. Henry to 10th, Fort Adams.

First Lieutenant Henry C. Herzog, CA-Res. to active duty, Fort Bragg.

First Lieutenant Monte J. Hickok, Jr. to 74th, Fort Monroe.

First Lieutenant Reese F. Hill, CA-Res. to active duty, QMC-Res., Washington, D. C.

First Lieutenant William A. Hinternhoff to 10th, Fort Adams.

First Lieutenant Charles H. Holland CA-Res. to active duty, Coast Artillery School.

First Lieutenant Rufus H. Holloway to

Panama Canal Department, sailing San Francisco, November 30.

First Lieutenant Jerry House CA-Res. to active duty, Fort Monroe.

First Lieutenant Carl Schomburg Ingle CA-Res. to active duty, Coast Artillery School.

First Lieutenant Jack P. Johns CA-Res. to active duty, Fort Bragg.

First Lieutenant Theodore F. Kane, Jr. CA-Res. to Hawaiian Department, sailing San Francisco, September 19.

First Lieutenant Henry J. Katz to Rock Island Arsenal.

First Lieutenant Jack H. Kellerman CA-Res. to Panama Canal Department, sailing New York, October 1.

First Lieutenant James J. Kelly, Jr. previous orders amended to sail from New York for Panama Canal Department, March 15.

First Lieutenant Edgar H. Kibler, Jr. transferred to Ordnance Department.

First Lieutenant James D. Land CA-Res. to Panama Canal Department, sailing New York, November 4.

First Lieutenant John L. Lanford CA-Res. to active duty, Randolph Field.

First Lieutenant Thompson C. Lawrence CA-Res. to Panama Canal Department, sailing New York, October 1.

First Lieutenant George L. Lemon CA-Res. to March Field.

First Lieutenant Richard C. Low CA-Res. to active duty, Fort George G. Meade.

First Lieutenant Willie C. Lowe CA-Res. to active duty, Fort Bragg.

First Lieutenant Gilbert B. Matthews CA-Res. to active duty, March Field.

First Lieutenant Alsey C. Miller, Jr. CA-Res. to Mississippi Institute of Aeronautics, Jackson, Mississippi.

First Lieutenant Douglass F. Moody, CA-Res. to active duty, Fort Monroe.

First Lieutenant Virgil S. Moore, CA-Res. to Hawaiian Department, sailing San Francisco, December 4.

First Lieutenant Carl B. Nelson CA-Res. to active duty, Hawaiian Department, sailing Charleston, November 15.

First Lieutenant Knox M. Oakley CA-Res. to active duty, Randolph Field.

First Lieutenant Joseph W. O'Connell CA-Res. to active duty, Kelly Field.

First Lieutenant Caleb E. Osborn, Jr. CA-Res. to Fort Ontario.

First Lieutenant James D. Ostrow CA-Res. to Puerto Rican Department, sailing New York, October 8.

First Lieutenant John B. Parrott CA-Res. to Darr Aero. Tech., Inc., Albany, Georgia.

First Lieutenant Holmes L. Payne, CA-Res. to Darr Aero Tech., Inc., Albany, Georgia.

First Lieutenant Finton J. Phelan, Jr. CA-Res. to active duty, Mitchel Field.

First Lieutenant John W. Pomeroy CA-Res. to Hawaiian Department, sailing San Francisco, December 4.

First Lieutenant William H. Price, Jr. to Panama Canal Department, sailing Charleston, November 29.

First Lieutenant William P. Price, CA-Res. to Puerto Rican Department, sailing New York, December 21.

First Lieutenant Harold R. Reifsnyder CA-Res. to Camp Peay.

First Lieutenant Lloyd G. Ross CA-Res. to active duty, Municipal Airport, Salt Lake City.

First Lieutenant Kermit R. Schweidel to 77th, Fort Bragg.

First Lieutenant James W. Seltzer, Jr. CA-Res. to active duty, Fort Monroe.

First Lieutenant Harry T. Smith to Panama Canal Department, sailing Charleston, November 29.

First Lieutenant Mike Smith CA-Res. to active duty, Camp Edwards.

First Lieutenant John J. Stark to 67th, Fort Bragg.

First Lieutenant Harry C. Swan CA-Res. to active duty, Mitchel Field.

First Lieutenant Edgar O. Taylor to 71st Fort Story.

First Lieutenant Edgar H. Thompson, Jr. to 2d, Fort Monroe.

First Lieutenant Raphael F. Tonge CA-Res. to Hawaiian Department, sailing San Francisco, September 19.

First Lieutenant Alan B. White to 5th, Fort Wadsworth.

First Lieutenant Ralph C. Wisner CA-Res. to active duty, Coast Artillery School.

First Lieutenant Thomas D. Woodward CA-Res. to Hawaiian Department, sailing San Francisco, September 19.

Second Lieutenant John E. Aber to 20th Fort Crockett.

Second Lieutenant Aubrey K. Adkinson CA-Res. to Office of the Assistant Secretary of War.

Second Lieutenant Robert N. Ames CA-Res. to active duty, Westover Field, Chicopee, Massachusetts.

Second Lieutenant Charles W. Bagstad to Montgomery, Alabama.

Second Lieutenant Robert L. Bailey to 75th, Fort Lewis.

Second Lieutenant George D. Bennett CA-Res. to active duty, MacDill Field.

Second Lieutenant Anthony Benvenuto to Montgomery, Alabama.

Second Lieutenant John A. Beoddy, Jr. CA-Res. to Panama Canal Department, sailing New York, October 1.

Second Lieutenant Albert H. Bethune to Panama Canal Department, sailing San Francisco, October 18.

Second Lieutenant Edwin F. Black to 5th, Fort Hamilton.

Second Lieutenant Francis X. Bradley to Panama Canal Department, sailing New York, November 4.

Second Lieutenant Daniel J. Brady CA-Res. to Panama Canal Department, sailing New York, October 1.

Second Lieutenant Alfred L. Brassell to 9th, Fort Banks.

Second Lieutenant Andre R. Brousseau to Randolph Field.

Second Lieutenant George T. Brown to Hawaiian Department, sailing Charleston, November 15.

Second Lieutenant William E. Buck, Jr. to Randolph Field.

Second Lieutenant Russell C. Buehler CA-Res. to Panama Canal Department, sailing New York, October 1.

Second Lieutenant Kenneth I. Bunn CA-Res. to active duty, McChord Field.

Second Lieutenant Harry F. Bunze to Moffett Field.

Second Lieutenant Walter E. Burrell CA-Res. to 75th, Fort Lewis.

Second Lieutenant John E. Burrows, CA-Res. to 61st, Fort Sheridan.

Second Lieutenant Russell R. Carl CA-Res. to active duty, Langley Field.

Second Lieutenant Robert McC. Carswell, Jr. CA-Res. to active duty, MacDill Field.

Second Lieutenant William D. Chadwick, Jr. orders to Panama Canal Department revoked.

Second Lieutenant Campbell G. Chambliss, CA-Res. to Panama Canal Department, sailing New York, October 1.

Second Lieutenant Martin B. Chandler to 78th, March Field.

Second Lieutenant Marshall Cloke to Moffett Field.

Second Lieutenant Thomas W. Colburn,

CA-Res. relieved from active duty, September 4.

Second Lieutenant Joseph M. Cole, Jr. to Moffett Field.

Second Lieutenant William F. Coleman to Montgomery, Alabama.

Second Lieutenant Thomas H. Corey, CA-Res. to Hawaiian Department, sailing San Francisco, December 4.

Second Lieutenant Fred M. Crawford CA-Res. to 75th, Fort Lewis.

Second Lieutenant Joseph P. D'Arezzo to Panama Canal Department, sailing San Francisco, October 18.

Second Lieutenant James R. Dawson CA-Res. to active duty, Moffett Field.

Second Lieutenant William N. DeLano CA-Res. to Philippine Department, sailing San Francisco, January 17.

Second Lieutenant Lionel B. DeVille to 71st, Fort Story.

Second Lieutenant Leslie O. Doane CA-Res. to Philippine Department, sailing San Francisco, January 17.

Second Lieutenant Weldon W. Doe CA-Res. to active duty, Maxwell Field.

Second Lieutenant Charles S. Dronberger CA-Res. to Philippine Department, sailing San Francisco, January 17.

Second Lieutenant Joseph J. Eaton to Montgomery, Alabama.

Second Lieutenant James M. Edmunds CA-Res. to Panama Canal Department, sailing New York, October 1.

Second Lieutenant Adam J. Eisenhauser CA-Res. to active duty, Westover Field, Chicopee, Massachusetts.

Second Lieutenant Dill B. Ellis to Montgomery, Alabama.

Second Lieutenant Jack C. Evans to Panama Canal Department, sailing San Francisco, November 30.

Second Lieutenant Walter J. Fitzgerald, Jr. CA-Res. to active duty, Westover Field.

Second Lieutenant Thaddeus P. Floryan to 7th, Fort Hancock.

Second Lieutenant Paul O. Franson, Jr. CA-Res. to active duty, MacDill Field.

Second Lieutenant Arthur T. Frontczak to Moffett Field.

Second Lieutenant George H. Garnhart CA-Res. to 75th, Fort Lewis.

Second Lieutenant Clarence E. Gushurst to Randolph Field.

Second Lieutenant Ridgley L. Hall CA-Res. to active duty, MacDill Field.

Second Lieutenant Albert W. Hand CA-Res. to active duty, Jefferson Barracks.

Second Lieutenant Harry J. Harding, CA-Res. to Philippine Department, sailing San Francisco, January 17.

Second Lieutenant John A. Heisler, III CA-Res. (QM-Res.) to Camp Lee.

Second Lieutenant Tom C. Henderson, Jr. to active duty, MacDill Field.

Second Lieutenant Edward H. Hendrickson to Panama Canal Department, sailing New York, November 4.

Second Lieutenant John S. Herrick CA-Res. to Panama Canal Department, sailing New York, September 26.

Second Lieutenant Bergen B. Howell to Panama Canal Department, sailing San Francisco, December 24.

Second Lieutenant Frank E. Howard CA-Res. to Panama Canal Department, sailing New York, September 26.

Second Lieutenant Aquilla B. Hughes, Jr. to Randolph Field.

Second Lieutenant Edgar James CA-Res. to active duty, Barksdale Field.

Second Lieutenant Donald L. Kendall CA-Res. to 75th, Fort Lewis.

Second Lieutenant William P. Kevan, Jr. to Montgomery, Alabama.

Second Lieutenant Thomas M. King, Jr. CA-Res. to 75th, Fort Lewis.

Second Lieutenant William R. Kinter to 22d, Fort Constitution.
 Second Lieutenant John H. Klinck, Jr. CA-Res. to active duty, Brooks Field.
 Second Lieutenant Mark C. B. Klunk to 5th, Fort Hamilton.
 Second Lieutenant Archie J. Knight to Moffett Field.
 Second Lieutenant James T. Lang CA-Res. to active duty, Moffett Field.
 Second Lieutenant Charles D. Lee, Jr. CA-Res. to active duty, MacDill Field.
 Second Lieutenant Stanley P. Lemke CA-Res. to 75th, Fort Lewis.
 Second Lieutenant Adolph J. Leocha CA-Res. to Panama Canal Department, sailing New York, October 1.
 Second Lieutenant Philip C. Loofbourrow to Montgomery, Alabama.
 Second Lieutenant James B. McAfee to Montgomery, Alabama.
 Second Lieutenant Arthur A. McCartan to Moffett Field.
 Second Lieutenant George A. McClister CA-Res. to 75th, Fort Lewis.
 Second Lieutenant Stewart L. McKenney to 9th, Fort Banks.
 Second Lieutenant Burton E. McKenzie to Montgomery, Alabama.
 Second Lieutenant Thomas F. Mansfield to Moffett Field.
 Second Lieutenant Samuel C. Mohler, Jr. CA-Res. to 75th, Fort Lewis.
 Second Lieutenant Thomas H. Muller to Randolph Field.
 Second Lieutenant Roy W. Nelson, Jr. to Moffett Field.
 Second Lieutenant John R. Neves, Jr. CA-Res. to active duty, Savannah Airport.
 Second Lieutenant Leonard M. Orman to 23d, Separate Battalion, Fort Rodman.
 Second Lieutenant Donald W. Painter, CA-Res. to active duty, Moffett Field.
 Second Lieutenant Maurice E. Parker to Moffett Field.
 Second Lieutenant Roger B. Payne, CA-Res. to Maxwell Field.
 Second Lieutenant John D. Pearson, CA-Res. to active duty, Selfridge Field.

Second Lieutenant John J. Pidgeon to 78th, March Field.
 Second Lieutenant Hobart B. Pillsbury to 9th, Fort Banks.
 Second Lieutenant William L. Porte transferred to Infantry.
 Second Lieutenant Robert L. Price, CA-Res. to active duty, Municipal Airport, Salt Lake City.
 Second Lieutenant Robert C. Raleigh to Randolph Field.
 Second Lieutenant James H. S. Rasmussen to Randolph Field.
 Second Lieutenant Charles W. Reeves to 76th, Fort Bragg.
 Second Lieutenant James McL. Ridgell, Jr. to Montgomery, Alabama.
 Second Lieutenant William C. Roberson, Jr. CA-Res. to Puerto Rican Department, sailing New York, October 8.
 Second Lieutenant Isidor Rossoff, CA-Res. to active duty, Municipal Airport, Orlando, Florida.
 Second Lieutenant Joseph W. Ruebel to Moffett Field.
 Second Lieutenant William W. Saunders to Moffett Field.
 Second Lieutenant Dudley B. Selden CA-Res. to active duty, Office of the Chief of Coast Artillery.
 Second Lieutenant Richard A. Shagrin to 23d Separate Battalion, Fort Rodman.
 Second Lieutenant Franklin S. Shawn to Moffett Field.
 Second Lieutenant Irvine H. Shearer to Montgomery, Alabama.
 Second Lieutenant Calvin O. Smith to 77th, Fort Bragg.
 Second Lieutenant Thomas K. Spencer to Panama Canal Department, sailing San Francisco, October 18.
 Second Lieutenant Warren C. Stirling to Montgomery, Alabama.
 Second Lieutenant Percy C. Stoddart, Jr. to Randolph Field.
 Second Lieutenant Charles E. Strahan, CA-Res. to active duty, Randolph Field.
 Second Lieutenant Julius B. Summers, Jr. to Montgomery, Alabama.

Second Lieutenant William G. Sylvester CA-Res. to Hawaiian Department, sailing San Francisco, September 19.
 Second Lieutenant Leonard E. Synroski to Randolph Field.
 Second Lieutenant Jack W. Taylor CA-Res. to Philippine Department, sailing San Francisco, January 17.
 Second Lieutenant Richard F. Taylor CA-Res. to Philippine Department, sailing San Francisco, January 17.
 Second Lieutenant John B. Titherington CA-Res. to active duty, Westover Field.
 Second Lieutenant Sheldon C. Tracy CA-Res. to 75th, Fort Lewis.
 Second Lieutenant Frank B. Wagner to Montgomery, Alabama.
 Second Lieutenant Alfred M. Waits CA-Res. to active duty, MacDill Field.
 Second Lieutenant Wade C. Wallis, CA-Res. to Panama Canal Department, sailing New York, October 1.
 Second Lieutenant Robert H. Warren to Montgomery, Alabama.
 Second Lieutenant Gordon L. Way, CA-Res. to active duty, Moffett Field.
 Second Lieutenant Elvin T. Wayment CA-Res. to Hawaiian Department, sailing San Francisco, December 4.
 Second Lieutenant Clyde H. Webb, Jr. to Moffett Field.
 Second Lieutenant George B. Webster, Jr. to Panama Canal Department, sailing San Francisco, December 24.
 Second Lieutenant Hilary J. Wentz, CA-Res. to Panama Canal Department, sailing New York, October 1.
 Second Lieutenant William Scott West CA-Res. to Hawaiian Department, sailing San Francisco, September 19.
 Second Lieutenant James W. Williams to Panama Canal Department, sailing Charleston, November 29.
 Second Lieutenant Solomon T. Willis, Jr. to Randolph Field.
 Second Lieutenant William H. Wood, CA-Res. to active duty, Selfridge Field.
 Second Lieutenant Howard T. Wright to Moffett Field.



Speed of Production

Our task in procurement is simply to serve the man who is to do the fighting in the field—to furnish him with the best weapons that science and industry can devise, and to see to it that the weapons are supplied in abundance.

Speed of production is the need of the hour. Whatever interferes with speed must be pushed out of the way. In the War Department we are resolved that red tape shall not delay us, that complicated and time-consuming procedures shall be simplified, that momentum shall be maintained in the placing of orders as well as in the acceptance of deliveries. When legal obstacles are encountered, ways will be found to remove them. You may depend on it that the national defense will not bog down by reason of administrative action. HONORABLE ROBERT P. PATTERSON, *Assistant Secretary of War, before Army Ordnance Association.*

The Contributors

COLONEL PAUL D. BUNKER, Coast Artillery Corps, has served with the Coast Artillery since 1903. His tabulation of "Coast Artillery Extension Courses for School Year 1940-41" should be of great assistance to our National Guard and Reserve officers.

✓ ✓ ✓

MAJOR REX CHANDLER, Field Artillery, spent his youth in Missouri and Ohio. All his service has been with the Field Artillery.

✓ ✓ ✓

LIEUTENANT COLONEL LEON C. DENNIS holds degrees from Texas Agricultural and Mechanical College, and Missouri University. He is now with the Coast Artillery School.

✓ ✓ ✓

MAJOR WILLIAM H. DUNHAM, Coast Artillery Corps, was born in Connecticut, and entered the Military Academy from that state. All his service has been with the Coast Artillery.

✓ ✓ ✓

MAJOR SAMUEL H. EDES, NGUS, began his service with the New Hampshire National Guard as a captain of Infantry, in 1911. Although he was in the Infantry until 1922, all his service since that time has been with the Coast Artillery. He graduated from the Army War College's G-1 course in 1926.

✓ ✓ ✓

CAPTAIN WARREN S. EVERETT, Corps of Engineers, started his military career as an Infantryman when he graduated from the Military Academy in 1935. Three years later he transferred to the Engineers and is currently on duty at Fort Belvoir delving into the mysteries of military transportation. The article in this number is a by-product of his daily work.

✓ ✓ ✓

LIEUTENANT COLONEL CHARLES R. FINLEY, Coast Artillery Corps, seems to enjoy service with Jarman's Jungle Artillery in the wilds of Panama. He was born in New Jersey, and was appointed to the Military Academy from Pennsylvania. He served with the General Staff Corps from 1931 to 1934.

✓ ✓ ✓

MAJOR GENERAL J. A. GREEN, Chief of Coast Artillery, needs no introduction to any artilleryman.

COLONEL DELMAR S. LENZNER, Coast Artillery Corps, commands the Submarine Mine Depot at Fort Monroe. Colonel Lenzner is a graduate of the University of Michigan, and after graduating lost no time in getting into the Coast Artillery Corps, with which branch he has served continuously since 1910. He holds the degree of Bachelor of Science in Electrical Engineering, and has distinguished himself both as a student and teacher.

✓ ✓ ✓

LIEUTENANT COLONEL LEROY LUTES, Coast Artillery Corps, has seen service both in the Infantry and the Coast Artillery. Born in Illinois, he began his service in the Washington National Guard in 1906. Colonel Lutes is a graduate of the Command and General Staff School and of the Army War College. He is now on duty at Third Army Headquarters, Fort Sam Houston, Texas.

✓ ✓ ✓

COLONEL FRED L. WALKER, General Staff Corps, was awarded the Distinguished Service Cross and the Purple Heart with oak leaf cluster for his service in France during World War I. He was born in Ohio, graduated from Ohio State University, and was commissioned in the Infantry soon after graduation. He has been an instructor at the Infantry School and the Army War College. At present, he is G-3, Headquarters Second Army.

✓ ✓ ✓

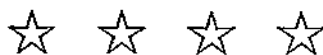
CAPTAIN MILAN G. WEBER, Coast Artillery Corps, is The JOURNAL's untiring correspondent in Hawaii. "Battle Practice," in this issue, is a welcome addition to the usual news letter from mid-Pacific.

✓ ✓ ✓

W. A. WINDAS is a free-lance writer. His "Story of Artillery Through the Ages" has been running in The JOURNAL for almost two years.

✓ ✓ ✓

CAPTAIN ROBERT J. WOOD, Coast Artillery Corps, is a Virginian. His service has been quite varied, considering that he is one of our younger officers. He instructed in History at the Military Academy, among other assignments. His literary endeavors have appeared in The JOURNAL before, as well as in magazines of general circulation.



BOOK REVIEWS



Exposé of Communistic Principles

FROM MARX TO STALIN. By J. E. LeRossignol.
New York: Thomas V. Crowell Company, 1940. 412
Pages; \$3.00.

In an era when we are beset with a host of "isms" which threaten our present way of life, this criticism of communism is particularly timely. It is timely because it sets forth in clear perspective the relationship between the various systems, under the banner of one "ism" or another, by which control of production and consumption is exercised. These systems may be divided into two main classifications: capitalism, which stands for "private ownership and management of the means of production and of the resulting income of goods and services"; and socialism, which "advocates collective ownership and operation of most, if not all, of the means of production, and the distribution of the income of goods and services in some equitable way." The ramifications of socialism are diverse and its forms and phases protean. However, in one form or another, it is the dominant characteristic of economy in the totalitarian nations today. Capitalism, on the other hand, has reached its highest development in our own country and in England.

LeRossignol's work is not to be read merely as a diversion. It requires concentration notwithstanding the masterly analysis which he makes of the various aspects of socialism. Particularly is this true with regard to the peregrinations of Marx and Engels through the abstract and abstruse fields of dialectical materialism and historical dialectics; yet so logically does the author lead the way, that even through this metaphysical haze the reader is enabled to behold their tautology, arriving at the unmistakable conclusion that these primary exponents of communism have attempted to base their program for proletarian dictatorship and a classless commonwealth on

theories which will not, in fact, support it. With scholarly discernment, LeRossignol explores the forbidding fastness of pure dialectics and the economic interpretation of history, pointing out how Marx drew from his study of these subjects, the weapons he used with telling effect in advancing the theory which bears his name.

To Marx's indictment of the capitalistic system under the theory of surplus value and the rate of surplus value, the author replies in all fairness, acknowledging the evils of capitalism and the sharp practices of small proprietors, but pointing out with authoritative statistics that the greater part of all surplus value must be paid out in wages, of which labor as a class receives the lion's share. Percentages of the annual net product of all major industries for the past two decades are quoted to show that over two-thirds of this product was returned to labor in form of wages. In 1929, it is pointed out that in the construction industry the total labor income amounted to ninety per cent of the income or value produced.

The author concedes that the failure of the communist experiment in Russia may not be the death knell of communism. He emphasizes the strong appeal of Marxism, not as a science, but to human ideals and emotions and impulses. Perhaps the comprehensive and far-reaching philosophy of Marx may find more fertile ground in a highly industrialized nation where people, rebelling against the frustration and poverty known to Marx, will find they have "naught to lose but their chains." Men are not born with equal creative and productive capacities, and those who by application of their faculties, have acquired wealth, will not be slow to oppose the theory of "work according to capacity, income according to needs."

♦ ♦ ♦

Things Always Happened

SAILOR OF FORTUNE: *The Life and Adventures of Commodore Barney, U.S.N.* By Hulbert Footner.
New York: Harper and Brothers, 1940. 305 Pages;
Illustrated; \$3.00.

Here is a well written tale of adventure that you will enjoy. The period is the stirring time of the Revolutionary War and the War of 1812. The hero is a seafaring man named Joshua Barney. He was one of those adventurous individuals who always seemed to be on the spot when things happened. He loved the sea. He

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sailed as a Naval officer, on business ventures, and as a privateer. In those days, enemy ships were legitimate prey and captured prizes a lucrative source of income. He made and lost several fortunes.

Barney's adventures began at the early age of thirteen in 1774 when, owing to the illness of the Captain, he had to take charge of a leaky old tub of a ship, loaded with wheat, bound from Baltimore to Nice. In spite of his extreme youth he got the ship to Gibraltar and then to Nice. After running foul of the authorities, he was jailed, only to emerge triumphant as the dinner guest of the Governor of Nice. On his return voyage he was forced to join the expedition of the King of Spain against the Dey of Algiers. That was the start of the Barney saga—things were always happening to Joshua Barney.

On his return to America Barney fought the British at sea in the Revolutionary War. All his life he fought the British. Barney's story is the story of the early fledgling American Navy. He was captured and imprisoned three times by the British. Sometimes he was treated well and exchanged. Once he experienced the foul floating prison ships in New York Harbor. He was taken to England and confined in the notorious Mill Prison. His resourcefulness, ingenuity, bravery, daring, and attractive personality were never more in evidence than in his escape and his trip across England to Holland.

A hero of many naval engagements, his greatest battle was as commander of the *Hyder-Ally* against the *General Monk*. After the Revolutionary War he became an admiral in the French Navy. The climax of his fighting career was his determined stand, with a handful of sailors, opposing the British advance on Washington at Bladensburg in 1812.

Barney came in contact with most of the great men of his day, both in America and Europe. With Barney the reader meets Robert Morris, George Washington, Benjamin Franklin, John Adams, Louis XVI, Napoleon, Touissant L'Ouverture and Christophe in Haiti, and hundreds of others. The author gives us intimate glimpses of the great men and of the life of that time. Joshua Barney was a most remarkable character and a real man.

The author has availed himself of an extended and imposing list of source material. The book is a real contribution to the early history of our Navy and our country.

Briefer Mention

BARBED WIRE ENTANGLEMENTS. By Major General Paul B. Malone, U.S.A. (Ret.). Harrisburg: Stackpole Sons, 1940. \$2.50.

This book is another of the author's West Point series. In it the hero of the series, Douglas Atwell, appears in command of a regiment during the stirring days of the World War.

Conducted Tour of the Navy

THE FLEET TODAY. By Kendall Banning. New York: Funk and Wagnalls Co., 1940. 346 Pages; Appendix; Index; \$2.50.

Here, in one chuckle-packed volume, is a guide to the United States Navy that can be enjoyed alike by prospective recruit and serious student of national defense.

Mr. Banning gets down to earth. He looks at the navy from the standpoint of the farm lad gazing at a recruiting poster, and follows the lad and others like him through the first preliminary physical examination and all the way to retirement.

If anything has been left out, it must be very minor, indeed. Naval slang, the pitfalls of the sailor, life on almost every type of naval craft, pay and allowances, messing on submarines, target practice—these and scores of other subjects are treated fully, in language any landsman can understand, and that any sailor can appreciate.

The text of our new naval policy, a list of naval ships commissioned and building, and a list of navy schools, add to the value of the book. It is a rare combination of good interesting reading and factual information.

If Mr. Banning neglects to write a similar book for the Army, he might be considered guilty of unjust discrimination.

Primer of International Politics

AMERICA AND A NEW WORLD ORDER. By Graeme K. Howard. New York: Charles Scribner's Sons, 1940. 121 Pages; Index; Foreword by General Harbord; \$2.00.

In this short volume, Mr. Howard undertakes an estimate of the situation that should prove of interest to the soldier and the voter. The reader need not agree with Mr. Howard's conclusions—the premises on which the conclusions are based are in themselves informative and thought provoking.

The book sets out to prove that our national policy and our international policy are, of necessity, interwoven, and that our national interest very often indicates courses that are counter to the immediate interests of certain of our national groups, and often to the dictates of our sympathies.

That you can't eat your cake and have it, too, seems to be one of the bases of Mr. Howard's reasoning. The fallacies of a favorable balance of trade, of artificial trade barriers, of the suppression of the "have-nots," of our stand in the war-debts controversies, of our international barking without biting—all are taken up and exposed to the cold light of logic.

The book lists three possible roads for our policy—blind interventionism, naïve isolationism, or cooperative regionalism. By the very manner in which the author has named the roads, the reader is aware of Mr. Howard's choice. Again, you may not agree with that choice—but it will make you think.

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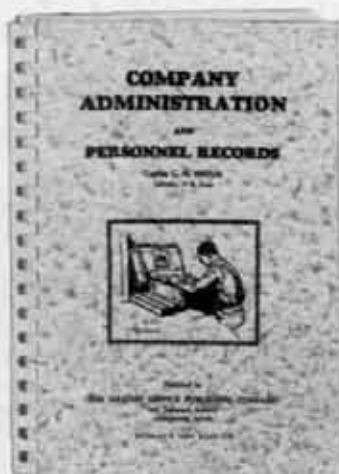
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Nationalist Statesman

RICHELIEU: HIS RISE TO POWER. By Carl J. Burckhardt. New York: Oxford University Press, 1940. \$3.75.

The situation of France in the Sixteenth Century when Richelieu came into power was very similar to that of Germany after the World War when Hitler set up his regime.

Richelieu was the first modern nationalist statesman to employ the theory of the balance of power, and, with its help, in twenty-five years he transformed France from an impoverished, faction ridden state into a great and powerful country. His methods of diplomacy are revealed and give an insight of the devious ways which can be used to turn potential enemies into close allies.

This book is a most interesting historical biography, especially now when the art of diplomacy seems buried under the avalanche of force.

The War at Sea

IN THE WAKE OF THE RAIDERS and THE MERCHANT NAVY FIGHTS. By A. D. Divine. New York: E. P. Dutton and Company, 1940. One Volume, 274 Pages. \$2.50.

The first part of the book is a résumé of the raids made by the pocket battleships. The author points out how disappointing these ships have proved so far and advances various reasons for their failure.

Many of the exploits of the pocket battleships such as the *Deutschland-City of Flint* episode, and the sinking of the *Rawalpindi* are covered in an interesting manner.

The Battle of the Plate and the inglorious end of the *Graf Spee* are described in detail.

The *Altmark* incident is a thrilling epic. This ship which carried in its hold the crews of sunken merchantmen was finally cornered by British destroyers and beached after she had run the North Sea blockade.

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